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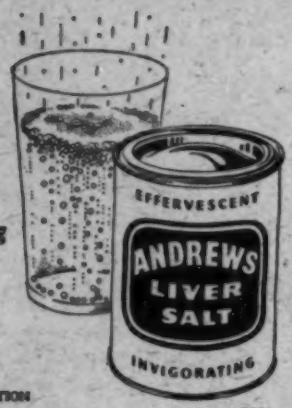

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BRITISH MEDICAL JOURNAL

LONDON SATURDAY JULY 17 1954

RESULTS OF PULMONARY VALVOTOMY AND INFUNDIBULAR RESECTION IN 100 CASES OF FALLOT'S TETRALOGY

BY

MAURICE CAMPBELL, D.M., F.R.C.P.

D. C. DEUCHAR, M.D., M.R.C.P.

AND

Sir RUSSELL BROCK, M.S., F.R.C.S.

From the Cardiac Department and the Thoracic Surgical Unit, Guy's Hospital

We recently reported the results of Blalock–Taussig operations in 200 patients with morbus caeruleus, 165 of whom had Fallot's tetralogy (Campbell and Deuchar, 1953). We wish to add a parallel series of 100 patients operated on by Brock's direct methods, and a more detailed follow-up and analysis of the 61 operated on at Guy's Hospital up to the end of 1952; 12 others have been operated on at Guy's Hospital during 1953, and the remaining 27 at the Brompton Hospital either for or in conjunction with Dr. Paul Wood. The first attempts at direct relief of pulmonary stenosis by valvotomy were reported by Brock (1948) and by Brock and Campbell (1950a), the latter paper including an account of 15 patients in whom the valvular stenosis was part of Fallot's tetralogy. Infundibular resections were first reported by Brock (1949) and by Brock and Campbell (1950b), who described the results obtained in 11 patients.

Our purpose is to report the subsequent progress of these early patients and the results in those who have been operated on since. Valvotomy only was carried out in 37, infundibular resection only in 45, and a combined operation in 18 in which the stenosis was valvular and infundibular: sometimes these have been grouped with those who had valvotomy as there were too few for separate analysis. All these patients were thought to have Fallot's tetralogy. Two (Cases V65 and 26*) had already had a Blalock operation which had resulted in only moderate improvement.

The 61 patients who had been operated on at Guy's Hospital up to the end of 1952, when the details of the follow-up were arranged, are the only ones included in the full analysis. In 23 the operation was valvotomy, in 25 infundibular resection, and in the other 13 a combined operation.

Age and Sex.—Most of the patients were children. Their age distribution is shown in Table I. Only two were under 5 years of age, nearly a third were between 5 and 9, and nearly a third were between 10 and 15. The youngest was 4 and the oldest 34. Boys and men slightly predominated—33 against 28 girls and women. These figures are very similar to those for the patients who had subclavian–pulmonary anastomosis, but the former were a little older, because preference was being given to those who were older at the time these direct operations were started.

Disability.—This was graded (Campbell, 1948) as IV in 13, III in 28, II in 16, and I in 4 before operation. The disability was on the average a little less than in those who had anastomotic operations. This was because the anastomotic operations started in 1947 and the present ones in 1948, and the most disabled had generally been chosen for operation first. The fact that the patients were older and had survived to this age implies that they had not always been the most severe cases or they would have died sooner, but the older patients chosen for operation were generally losing ground, and sometimes seriously so. We think that the slighter disability and the greater age (with its greater operative risk) balance each other and make the two groups closely comparable. The disability grading in the valvotomy series differs from that in the resection series only by including more patients in grade IV and fewer in grade II.

TABLE I.—*Age Distribution of Patients and Deaths after Operation*

Age in years:	No. of Cases in Each Age Group					Total
	0–4	5–9	10–14	15–19	20+	
Pulmonary valvotomy alone and combined	2	12	9	7	6	36
Infundibular resection	0	7	10	3	5	25
Both operations	2	19	19	10	11	61
Deaths after operation	0	3	2	2	4	11
Proportion of deaths	14%		11%	20%	36%	18%
Proportion of good results	52%		84%	60%	54%	64%

Cardiac Catheterization in Diagnosis

The general findings of catheterization and the value of various special investigations in the diagnosis of morbus caeruleus, and their limitations in the assessment of the results of anastomotic operations, have been discussed (Campbell and Deuchar, 1953). Catheterization has a more valuable place in assessing the haemodynamic changes after direct operations (see later), and has the same value in diagnosis and an added value in elucidating the anatomy of the right ventricular outflow tract, for its precise anatomy is more important to the surgeon than before an anastomotic operation.

Physical signs may be helpful but are not reliable in differentiating valvular and infundibular stenosis. A good angiocardiogram may demonstrate clearly the exact site of the stenosis present in Fallot's tetralogy, but often it does not give a decisive answer or may even lead to a

*Case numbers starting with V indicate those who had valvotomy, and the numbers without a prefix those who had infundibular resection only.

wrong conclusion (Campbell and Hills, 1950; Lowe, 1953; Goodwin *et al.*, 1953); though selective angiocardiography may perhaps succeed more often (Jönsson *et al.*, 1953). Cardiac catheterization has proved more reliable in determining the exact nature of the stenosis. This subject has recently been discussed in detail by Connolly *et al.* (1953), and our findings are in complete accord with theirs.

Briefly the method may be described as follows: the catheter, having been introduced into the pulmonary trunk, is slowly withdrawn while continuous recording of the pressure is taken. Three types of record may then be obtained, depending on the character of the stenosis. (1) A sharp rise in the systolic pressure to the right ventricular systolic pressure as the catheter passes through the valve region indicates a valvular type of stenosis. (2) No change in the systolic pressure with a fall of the diastolic pressure when the catheter passes through the valve, followed by a rise in the systolic to the right ventricular level at the infundibular region, indicates infundibular stenosis. (3) A combined type of record in which the pulmonary arterial tracing gives way at the valve site to the higher systolic and lower diastolic pressure of the infundibular chamber, and a further rise in the systolic pressure to the right ventricular level at the site of the infundibular stenosis indicates the presence of valvular and infundibular stenosis.

Apart from the character of the tracing obtained during ordinary cardiac catheterization, the site of the stenosis can often be identified from its position when the major change in the systolic pressure occurs, if the position of the catheter tip can be observed by radioscopy.

During Operation.—Direct operations are generally performed on patients with simple pulmonary stenosis or Fallot's tetralogy, and the diagnosis can often be made without any special investigations. In cases diagnosed as Fallot's tetralogy the full routine of cardiac catheterization has not been used solely to determine the type of pulmonary stenosis present, but instead it has become our practice to carry out a modified procedure at the time of operation. An initial small cardiotomy incision is made in the right ventricle and a catheter attached to the recording manometer is introduced by the surgeon and passed into the pulmonary trunk, and the procedure is given greater precision by being coupled with direct inspection and palpation of the region by the surgeon. By these means a high degree of accuracy in determining the precise type of the stenosis can be achieved.

When the surgeon has performed the appropriate operation, the pressure records are repeated to determine the effect, and the value of this is emphasized later in the discussion.

Method of Follow-up

This has been carried out in exactly the same way as for those who had anastomotic operations (Campbell and Deuchar, 1953). We have seen most of the patients several times and have tried to see them annually, near the anniversary of their operation, but could not always adhere to this strictly. We have therefore counted the visits between 10 and 21 months as one year; between 22 and 31 months as two years; between 32 and 43 months as three years; and 44 months and over as four years. No patient has been lost sight of, except one who emigrated to Canada 28 months after her operation. In three we have accepted reports and radiographs from their doctors for the follow-up: one of these returned to Africa within a few months of his operation and the other two are in Scotland.

The period of follow-up of the patients who left hospital was as follows—four years, 12; three years, 10; two years, 20; and one year, 8. The assessment of the degree of improvement was made in the same way as for those who had an anastomotic operation. It was made by two of us without any reference to R. C. B., and it has not been very common for a surgeon's results to be judged in this way by physicians.

Results in Early Patients after Infundibular Resection

Before classifying the results, the present condition of the first eight who recovered after infundibular resection is described shortly to give a general picture. The good results of the early survey have been maintained for another three years, though in two patients the heart is larger than one would wish.

Case 1.—A year after operation this patient could walk a mile instead of 100 yards. After five years she is stronger and has walked two miles. She is working as a dressmaker, but is content with a quiet life and has not pushed herself.

Case 2.—A year after operation this patient was leading a normal student life, and was able to dance all evening and to walk five miles, instead of a mile with difficulty. After five years she leads a very active life, but paroxysmal tachycardia troubles her if she does too much. Her cardiothoracic ratio (c.t.r.), which was large before operation, increased soon after (56 to 60%), but not progressively.

Case 3.—This man was at regular work and a year after operation was able to walk four miles, although before it he was getting worse and could not walk more than 100 yards on a good day. After five years he is leading a normal life, working regularly and easily walking five to six miles at the week-end. His heart has not increased in size (Fig. 1). Cardiac catheterization shows that the right-to-left shunt has been reduced and that the pressure in the pulmonary artery has not become too high (see Table VI).

Case 4.—This boy was able to lead a quiet life at school and play cricket a year after operation. After four years he is just as well, but is clumsy and mentally backward, and this prevents greater activity. His heart has not become larger.

Case 6.—This patient had walked three miles and played football a year after operation. After four years he is just as active and works as a shop assistant; he is ready for football and other games in addition to his day's work. There is no undue increase in the size of his heart.

Case 7.—A year after operation this patient could walk four miles. During the next two years he played football and became an enthusiastic cyclist. Although he felt as well as ever, we thought that he was doing too much and that the heart was too large (c.t.r. 48 to 58%) (see Fig. 2). He has given up the long-distance cycling and football, but leads a normal life and plays cricket, and after four years the heart is a little smaller (56%, see later). Cardiac catheterization shows that his right-to-left shunt has been reversed, the arterial O_2 saturation is 95% instead of 72%, and the pulmonary pressure is still low (18/7).

Case 8.—A year after operation this patient could walk two miles and do light work for half a day. Either from gaining confidence or from real progressive improvement, she now, after four years, does a full day's work in a shop and can dance afterwards; she can walk two to three miles, which is all she wishes, at the week-end. There is no undue enlargement of the heart.

Case 9.—A year after operation this patient had lost her attacks of faintness and could walk two miles. After four years the result is excellent: she is leading an active life at school and doing all she wants, without undue enlargement of the heart.

Classification of Results

The classification of the patients after operation is shown in Table II. Very few who survived obtained no benefit. Generally speaking, the results of valvotomy and of infundibular resection are very similar, and are comparable to those of anastomotic operations (Campbell and Deuchar, 1953; Taussig and Bauersfield, 1953), though some significant differences are referred to later. The results of the two direct operations for Fallot's tetralogy are considered together, though the illustrative cases are from those who

had valvotomy, seeing that examples of infundibular resection have just been described.

TABLE II.—*Results of Valvotomy and Infundibular Resection in Fallot's Tetralogy*

Result of Operation	First 61 Guy's Cases		Total 100 Cases (Percentages)				Anastomotic Operations for Fallot's Tetralogy
	No.	%	Valvotomy Only	Combined Operation	Infundibular Resection	Total Direct Operations	
Very good	28	46	49	39	57	51	54·5
Good	11	18	24	16·5	18	20	23*
Some improvement ..	10	16·5	14	28	7	13	8·5
No improvement or no operation possible	1	1·5	2	—	—	1	5·5
Deaths at or soon after operation	11	18	11	16·5	18	15	8·5
Total No. ..	61	—	37	18	45	100	165

* Includes 3% in which the result was good but the patient has died subsequently.

Group I: Patients with Very Good Operative Results (28)

We have classed a result as very good when the patient can earn his living or attend an ordinary school and can walk three to four miles: he is living a normal life except for the more vigorous activities that are not essential. If he could not walk 100 yards before operation we have classed the result as very good even when he has not reached this standard but can walk a mile.

The proportion with very good results is nearly as high as among those who had anastomotic operations for Fallot's tetralogy; nor was there any great difference between those who had valvotomy and those who had infundibular resection (see Table II). Three examples are quoted.

Case V3.—A girl aged 11 had severe cyanosis and could walk only 100 yards. She improved quickly after operation, and two years later had an almost normal colour and was doing all she wanted at school, including drill but not games (Brock and Campbell, 1950a). She has maintained this progress and works as a telephonist: she can easily walk four miles and can dance most of the evening. She is free from any symptoms and looks a healthy, well-developed girl.

Case V10.—A man aged 22 was less disabled, as he could walk two miles and earn his living as a clerk, but he was deeply cyanosed, with a haemoglobin of 180% and a red-cell count of 9,400,000, so that there seemed a risk of cerebral thrombosis. A year after operation he could lead his previous life easily instead of with difficulty. His improvement has been maintained over the four years and he has been regularly at work and can lead a normal quiet life. His haemoglobin has remained at about 118% instead of 180%.

Case V20.—A boy aged 13 could walk only 100 yards. Though at first he was classed as no more than "improved," three years after operation he leads a life that is almost normal and plays some games, including football—in goal. Contrary to the general rule, his cyanosis, which was only moderate, has not changed much and his haemoglobin has hardly fallen from about 120% in spite of the great improvement.

All these patients had valvotomy, and the last had infundibular resection as well.

Group II: Patients with Good Results (11)

We have been conservative in including cases in the highest class. When a patient falls short of this high standard in some particular but leads a normal quiet life we have recorded the result as good. The good results are much the same as in those who had anastomotic operations. The first patient who had a successful valvotomy for Fallot's tetralogy may be given as an example.

Case V2.—A girl aged 18 could not walk more than 200 yards in summer and rarely went outside in winter: she squatted constantly. Two years after operation she had improved a good

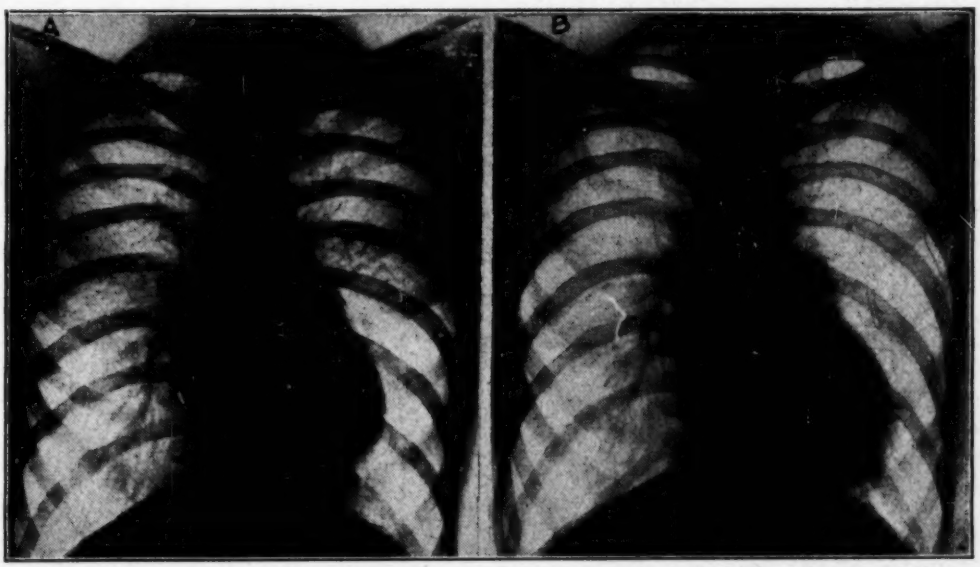

FIG. 1.—Little change in heart size five years after a very successful infundibular resection. (A) Before operation, c.t.r. 46% (11.8:25.4 cm.). (B) Five years after, c.t.r. 47% (12.2:26 cm.). Case 3.

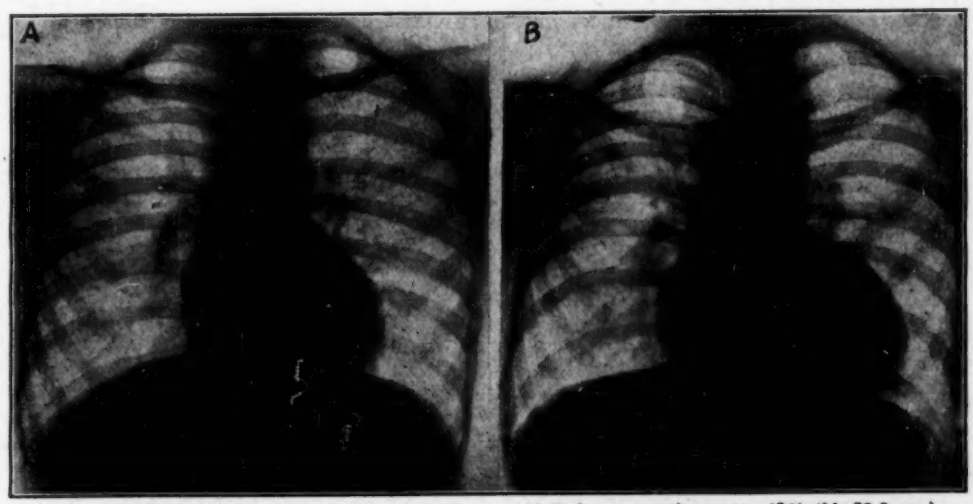

FIG. 2.—An unusual increase in the size of the heart. (A) Before operation, c.t.r. 48% (11:23.2 cm.). (B) Three years after operation, c.t.r. 58% (15:26.2 cm.), associated with rounding of the left border; undue pulsation could be felt in this area. Clinically, he was extremely well, but he was advised to do rather less. Case 7.

deal and could sometimes walk a mile (Brock and Campbell, 1950a). She has steadily improved, more slowly than usual, perhaps because of initial pain in her legs from arterial embolism after the operation. She can walk a mile and lead a quiet life as a musician, travelling to and playing at concerts, and is nearly as good during the winter.

Group III: Patients with Some Improvement (10)

This group contains all those who were still seriously limited in activity but showed real improvement, which sometimes meant a lot to them. It seems most difficult to be sure of a good result after valvotomy (alone or combined with infundibular resection), for there are more such patients classed as "improved" only, perhaps because the importance of an added infundibular stenosis was sometimes missed or not sufficiently appreciated in the early cases.

Case V4.—A woman aged 25 was almost confined to one room. Two years after operation she could walk to the village shops a quarter of a mile from home and was sure this more than compensated her for the disability of the hemiplegia that followed her operation. Without this the result would have been good; but, generally, inclusion in this group is because the operation itself was not as successful as usual.

One patient who was only slightly improved after infundibular resection had recently had an anastomotic operation, and the result is very good.

Group IV: Patients who were Improved but Died Later

No patients have been included in this group, though one (Case 19) who had a very successful infundibular resection and could lead a normal quiet life instead of being almost a complete invalid died nine months after her operation. We have excluded her because she died from Landry's acute ascending myelitis. Her death gave us the chance of seeing a heart after the infundibular resection has healed, and the appearance is most encouraging. The stenotic ring seems to have been removed almost completely and the surface of the infundibulum looks smooth and healthy. We are indebted to Dr. Enticknap for the following histological report. "A scar composed of cellular fibrous tissue runs from pericardium to endocardium, completely separating the muscle on each side: it varies in width from 2 to 5 mm. There is no active inflammation though the scar is not the quiescent hyalinized type that forms in the rectus muscle after laparotomy. There is very little scarring of the pericardium, although a small foreign-body granuloma is present; there is, however, an endocardial scar 1 mm. thick. There are some irregular islands of muscle cells within the scar, and 3 mm. from it there is an area of myocardial degeneration, 1 mm. in diameter, resembling a healed infarct, although patent arterioles traverse it."

Groups V and VI: Patients with No Improvement after Operation or in whom No Operation was Possible

It was possible to perform an operation in every patient, and perhaps this is one advantage of direct over anastomotic operations, though the latter are rarely, if ever, impossible in Fallot's tetralogy.

There was only one patient who gained no benefit, and he had needed valvotomy and infundibular resection; three years later he had an anastomotic operation, with a good result.

Group VII: Patients who Died at or Shortly after Operation

Pulmonary Valvotomy.—Of the first 16 patients with Fallot's tetralogy who had this operation, 3 died (Brock and Campbell, 1950a). Among the next 20 operated on at Guy's Hospital there were two more deaths, so that the operation has become reasonably safe. Considering the severe disability that was often present, 5 deaths in 36 cases cannot be regarded as very high, and the mortality is well under 10% when there are no unfavourable features (see Table II). Two of the five patients were over 20 years of age. All but one died during or very shortly after the operation from cardiac arrest. The youngest, aged 5, was thought to have Fallot's tetralogy but was found *post mortem* to have a single A–V valve and functionally a single ventricle with pulmonary stenosis. The one patient who recovered from the operation but died four months later seemed to be improved at first but was readmitted from convalescence as she had lost ground; in spite of treatment she steadily became worse. At operation some difficulty with the use of the infundibular punch led to its withdrawal in the open position through the cardiotomy incision and to some laceration of the myocardium: it was thought at the time that this was satisfactorily sutured. At necropsy the cause of death was found to be pressure on the root of the pulmonary trunk by a large aneurysm of the right ventricular wall arising at the site of the cardiotomy.

Infundibular Resection.—In spite of the apparent difficulty of such an operation there was only one death in the first eight patients (Brock and Campbell, 1950b). This auspicious beginning was, however, followed by a disappointing period in which five of nine patients died. Fortunately there was no death in the next eight patients, but the total mortality remains higher than for simple valvotomy. The ages of these patients ranged from 8 to 34, but three were 20 or over and the mean age was 19 years. The three eldest all died during or at the end of the operation. The fourth died shortly after, apparently from cardiac arrest, and the fifth died a few hours after with a haematoma under the endocardium of the right ventricular outflow tract which was obstructing the passage of blood to the pulmonary trunk. The sixth developed cardiac arrest during the operation and was successfully resuscitated, but suffered permanent cerebral damage and died twelve days later.

Combined Groups.—In the Guy's Hospital combined series of both direct operations the mortality was 18%, but this was lower in the whole series (see Table II). Disability in these cases was much the same as for the survivors. The haemoglobin before operation ranged from 102 to 172%, with a mean of 134%, which is little higher than for all the survivors. The size of the heart was not a deciding factor, for the c.t.r. ranged from 48 to 61% with a mean value of 51%, which is only slightly higher than that for the rest of the series. The only heart where it exceeded 55% (c.t.r. 61%) was in the patient with a single A–V valve—the only one who was known not to have uncomplicated Fallot's tetralogy. The figures are not large enough for separate analysis of the different operations by age, but the operative mortality increased with age, being 12% in those of 14 and under, 20% from 15 to 19 years, and 36% in those over 20 years (see Table I). Two of these patients, aged 28 and 34, were operated on because they had become very disabled after many years of reasonable activity.

Objective Effects of the Operation

In describing the results of the Blalock–Taussig operation we discussed the reduced cyanosis and clubbing, the reduction in polycythaemia, the increase of the heart size, the widened systemic pulse pressure, and the continuous murmur. The last two are peculiar to the creation of the anastomosis. The other changes are reflections of the general improvement that follows an increase in pulmonary blood flow, and are therefore, not surprisingly, found in the present series also.

Changes in Physical Signs.—The continuous murmur provides a reliable auscultatory sign that the anastomosis is working. After valvotomy or infundibular resection there is no comparable sign. A successful result may be followed by a louder murmur and a coarser thrill, but often there is no decisive change. Nor was there any consistent change in the pulmonary second sound, though sometimes it was rather louder after operation. Only three patients developed a diastolic murmur. In one of these (Case 21, see later) the shunt was completely reversed, and the diastolic murmur, which was maximal in the mitral area, was thought

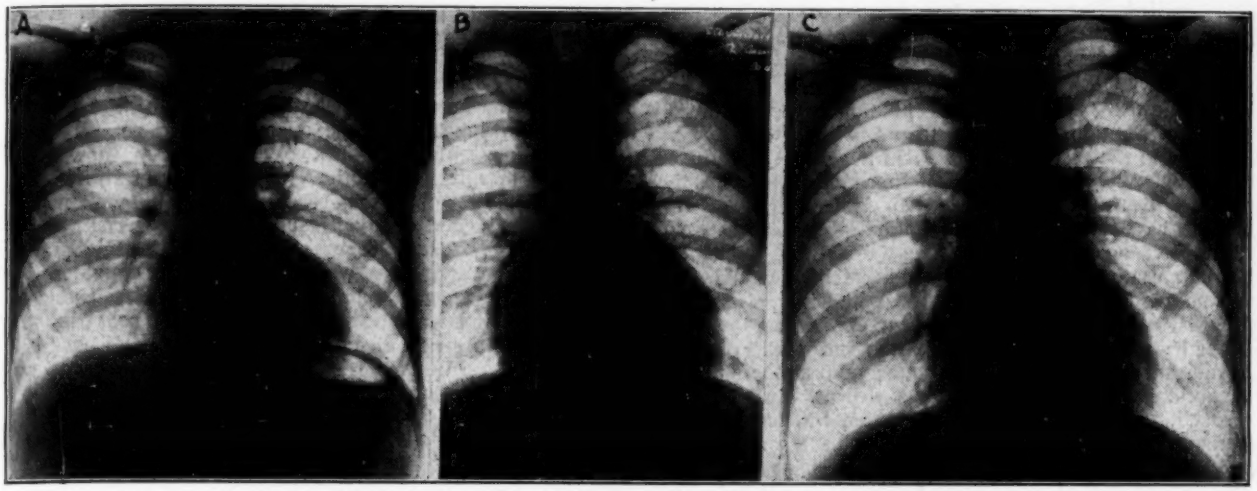

FIG. 3.—Increase of heart size with the development of pulmonary regurgitation after pulmonary valvotomy. (A) Before operation, c.t.r. 51%. (B) A year after, when he was found to have pulmonary regurgitation with moderate increase, c.t.r. 57%. (C) Three years after, with the heart somewhat smaller though he had continued a normal life with some games at school, c.t.r. 53%. Case V25.

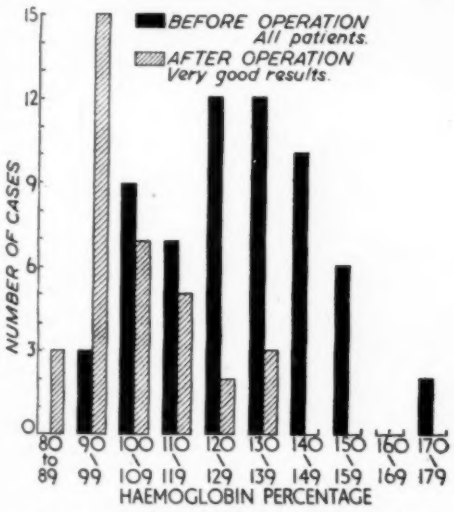

FIG. 4.—Frequency distribution of the haemoglobin percentages in all patients before operation and in those with very good results after operation. Before, the majority were between 120 and 160%. After, the majority were between 90 and 120%. The figures are almost the same as for those who had anastomotic operations. (100% = 15.6 g. per 100 ml.)

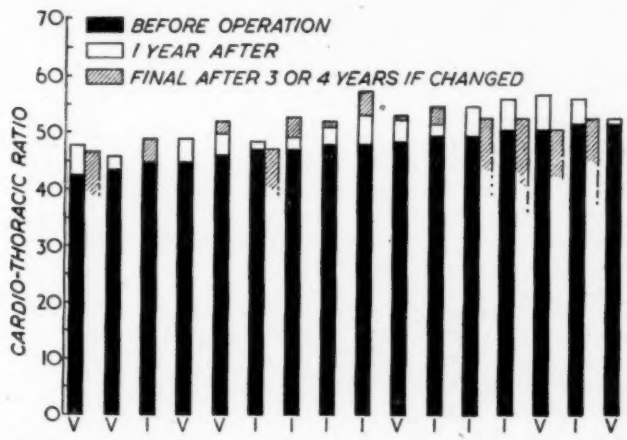

FIG. 5.—Heart size as measured by the c.t.r. before and after operation. The first 16 patients with very good results, all followed for three years or more, have been arranged according to the initial size of their heart. The unshaded area above each black column shows the increase in size within the first year. The lightly shaded area above this shows the increase during the subsequent two or three years, but it was never large and often there was no further increase and sometimes a decrease shown by the shaded column on the right.

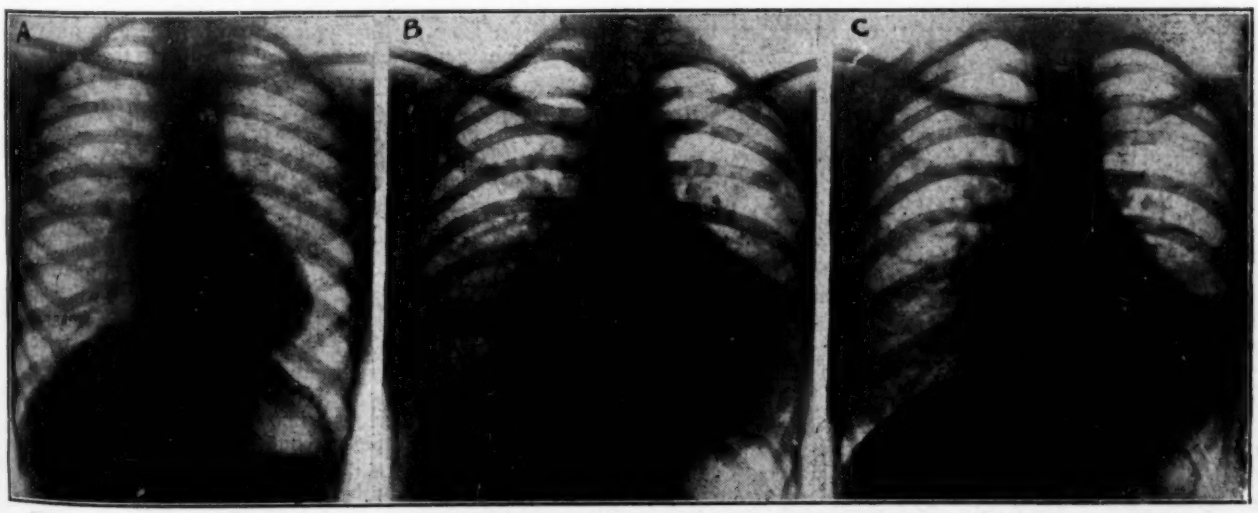

FIG. 6.—Gross increase in heart size after infundibular resection in a patient in whom the right-to-left shunt was reversed. (A) Before operation, c.t.r. 48%. (B) Eight months after operation, showing great increase in the lung markings and in the size of the heart, c.t.r. 67%. (C) Eighteen months after operation, showing some reduction in heart size with a less active life, c.t.r. 64%. Case 21.

to be functional and of the type often heard with septal defects. The other two were thought to have developed pulmonary regurgitation after valvotomy.

Pulmonary Regurgitation.—When valvotomy was under consideration the production of pulmonary regurgitation was one of the things that were feared. When we reported the results in the first 33 cases we had not seen this complication; but we have since seen it four times, though only twice in patients with Fallot's tetralogy. One of these was found to have pulmonary regurgitation when he was seen a year after operation: he was very well and wanted to add rugger and swimming to his other school games, but this was not allowed, as his heart size had increased (c.t.r. 51 to 57%) (see Fig. 3). After three years he keeps as well and the heart has become smaller (53%), but a loud regurgitant murmur is still present. In the second case the murmur was noticed almost at once after the operation: he was improved both as regards his colour and his activity, and has maintained this for two years; the heart quickly became larger (c.t.r. 48 to 57%), but has not changed further.

Pulse Pressure.—There was no significant change in the pulse pressure after operation, and this might be expected. Only one patient has shown an increase of as much as 15 mm., and this was associated with a general rise of blood pressure (95/65 to 135/90) during the five years he was under observation. After Blalock–Taussig operations a few patients, presumably those with the largest anastomotic blood flows, showed an increase of pulse pressure of 15 mm. Hg or more.

Cyanosis and Clubbing.—The improved colour after the operation is roughly parallel to the improved capacity. This applies to both the resection and valvotomy groups. Three patients from each group lost all their cyanosis, and many showed only minimal cyanosis even with exercise. This compares with only two completely devoid of cyanosis in the larger series with anastomotic operations. The difference is mainly because the shunt was greatly reduced and in some patients even reversed so that there was a normal arterial oxygen saturation. There was a parallel improvement in the clubbing of the fingers and in the cyanosis. In one or two cases clubbing has practically disappeared even when assessed as severe before the operation—for example, Case V35, Table VI. A change of this degree was not observed in the anastomotic series.

Reduction in Polycythaemia.—The fall in the haemoglobin percentage resulting from a successful operation is shown in Table III. The mean haemoglobin percentage is

TABLE III.—*Reduction of Haemoglobin after Operation*

	Result of Operation			
	Very Good	Good	Some Improvement	Death
No. of cases	27	8	10	11
Mean Hb before operation (%) ..	130·5	124	135	134
Mean Hb after operation (%) ..	103·5	101	111	—

100% haemoglobin = 15·6 g. per 100 ml.

reduced from 130 to 103% for the very good results. The range in the whole series before operation and in the very good and good results after operation is shown in Fig. 4. These findings are for the valvotomy and infundibular resection groups, combined because they showed no difference. They bear a remarkable resemblance to those found for the anastomotic series.

Increase of Heart Size

An anastomotic operation creates what is virtually an artificial ductus, and so was expected to, and in fact often does, produce some increase in the size of the heart. This has sometimes been used as a basis for criticism of the operation. In our follow-up study after anastomotic operations such enlargement was not often a cause for anxiety. We hoped at first that the direct operations would benefit the patient without making the heart larger, and, indeed, that they might make it smaller owing to the relief of the stenosis. It was found, however, that direct operations for the stenosis in Fallot's tetralogy caused some increase in the heart size very similar in degree and range to that following anastomotic operations (Fig. 5).

Our findings are given in two tables, which show the change in size related to the clinical result of operation (Table IV) and the changes in successive years in the patients obtaining very good or good results (Table V). There was no significant difference between those who had infundibular resection and those who had pulmonary valvotomy, and the figures are remarkably similar to the corresponding ones from the anastomotic series. Here enlargement cannot be due to the creation of an artificial ductus and is not the result of the cardiotomy scar, as patients not achieving a good result show no change (Table IV). Presumably it

TABLE IV.—*Heart Size Before and After Direct Operation*

		Cardiothoracic Ratios				
		Very Good Results	Good Results	Some Improvement	Deaths	All Cases
Before operation	Mean	% 49·1	% 48·4	% 49	% 51·3	% 49·4
	Range	43–56	42–56	41–59	48–61	41–61
After operation ..	Mean	52·7	52·5	49·9	—	—
	Range	46–61	46–57	41–56	—	—

TABLE V.—*Average Heart Size Each Year after Direct Operations (Very Good and Good Results Combined)*

No. of Cases	Cardiothoracic Ratio					
	Before Operation	Less than 6 Months After	1 Year After	2 Years After	3 Years After	4 Years After
	%	%	%	%	%	%
9	49·6	53·2	52·5	52·5	53	53·2
8	47·6	51·7	51·5	51·1	50·8	—
10	50·9	55·3	54·7	54·1	—	—
6	48·0	54·3	53·9	—	—	—

reflects the increased ventricular volume needed for the increased cardiac output that results from the greater pulmonary blood flow even at rest and more so during the greater physical exertion that can now be attempted. If this is correct it is not surprising that the changes should be, on the whole, about the same in both types of operation.

The heart size before operation, one year after, and three or more years after in the 16 cases that achieved a very good result and have been followed for that length of time is shown in Fig. 5. Comparison of this diagram with the similar one we have published for the anastomotic series shows rather fewer patients in whom there has been any great increase after the first year and rather more in whom some of the earlier increase has been lost during the following years.

The average c.t.r. after a successful operation shows an increase of nearly four points after a year, with little change subsequently (Table V). As with the anastomotic operations, these main features conceal a wide range of variations, and some indication of this in the very good results is given in Fig. 5. As the mean increase was about four points we have picked out all those patients showing an increase of six points or more—four in the infundibular resection series and six in the valvotomy series. Two who achieved good results after resection showed progressive increase of heart size, the c.t.r. increasing gradually from 47 to 53% over three years and from 43 to 51% over two years respectively. Case 7 (see Table VI), an excellent result after infundibular resection, had an initial c.t.r. of 48%, which increased to 53% one year after: three years after operation he was still very good in every way except that it had increased further to 58% (Fig. 2). After four years with a rather less active life it is only 56%, but there is still visible and palpable pulsation over the left border

of the heart that might suggest some dilatation at the site of the cardiotomy scar. In the fourth (Case 21, see below) the initial c.t.r. increased during the first six months from 48 to 67%, which made us anxious lest she should develop cardiac failure; but fortunately it has decreased to 64% a year after (Fig. 6) and to 61% two years after operation.

Six of the patients in the valvotomy group have shown an increase of between six and nine points, but none more than this. Four of these have shown a progressive increase, the cardiothoracic ratio having increased from 50 to 57% after four years, from 46 to 52% after three years, from 48 to 54% after two years, and from 49 to 57% after two years. The other two have shown a large initial increase that has not been progressive—from 48 to 57% and from 53 to 58%—this being partly due to the development of pulmonary regurgitation in the former. Those who have shown a progressive increase in the heart size are counterbalanced by those in whom an initial increase is subsequently, at least partly, reversed.

In four of these ten the heart was small enough before operation to leave the patients with a c.t.r. still between 52 and 54%. In six, however, it is now larger and between 57 and 64%, and in two of these (Cases 7 and 21), and in these two only, the large size and the unusual degree of pulsation give us some anxiety about their future although the shunt has been reversed and the clinical result is excellent.

The results were much the same in the anastomotic series, where in 20 of the 200 the increase of the heart size was 6 points or more. In 10 of these the heart was small enough before operation to leave them with a c.t.r. still between 52 and 55%. In the other 10 (three of whom had lesions more complex than Fallot's tetralogy) the c.t.r. is between 57 and 67%, and in two or three of these the size or the progressive increase makes us anxious about their future.

Progress after Operation

The improvement may come more slowly after direct than after anastomotic operations. After an anastomosis one generally has a good idea of the result within a day or two, and certainly before the patient leaves hospital, apart from those few in whom poor muscular development prevents the improvement becoming manifest as quickly as this. And, apart from symptomatic improvement, the presence of a loud anastomotic murmur is generally a reliable guide.

Sometimes the improvement can be recognized equally early after direct operations, but not always. Eight of the 61 patients were thought to have gained little or no benefit when they left hospital, but after six or twelve months they had improved much more, often to reach the highest group. This is easier to understand after infundibular resection, for 2 of the 25 patients were thought at first to have slight improvement only but later reached the best group. It was, however, even commoner after valvotomy—6 of the 36 gaining their main improvement some months later: two of these actually left hospital classed as failures but later achieved good results. In addition there were four who showed some progressive improvement for a year or more, but this may have been due to their gaining confidence in their increased capacity.

Post-operative Complications.—Patients after cardiotomy have been kept in bed longer, generally for three weeks. There is often some pericardial effusion which makes the cardiac shadow still larger than it would be, but this generally resolves quickly, and only two or three patients have needed paracentesis of the pericardium. The effusion is generally sterile—either from the start or as a result of treatment with antibiotics—and has rarely led to any difficulty. Immediate complications have been uncommon. A few patients have developed congestive failure, but it has cleared up spontaneously or with digitalis after a few weeks at the longest.

Bacterial endocarditis and cerebral abscess have not so far occurred in any of these patients, though they must remain a possible risk. Only one developed a cerebral thrombosis after operation.

Electrocardiographic Changes during and after Direct Operations

All these patients had right axis deviation and right ventricular preponderance, as shown by the high R/S ratio in leads V_1 or occasionally only in V_3R. Four of them showed the pattern of severe right ventricular strain that is much commoner with pulmonary stenosis with a closed ventricular septum, when T was deeply inverted in V_1 to V_4 or even further to the left.

In Fallot's tetralogy one cannot expect diminution of the preponderance of the right ventricle, as it is still in communication with the left ventricle and working against the systemic pressure. There has, in fact, been no such diminution after direct operations any more than after anastomotic operations. It is more likely to increase after some years, as the patient leads a more active life and makes a greater demand on his heart, but the extent to which this has happened does not seem to be of clinical significance so far.

The changes after pulmonary valvotomy and after infundibular resection were analysed separately, but as no difference was found the figures have been combined.

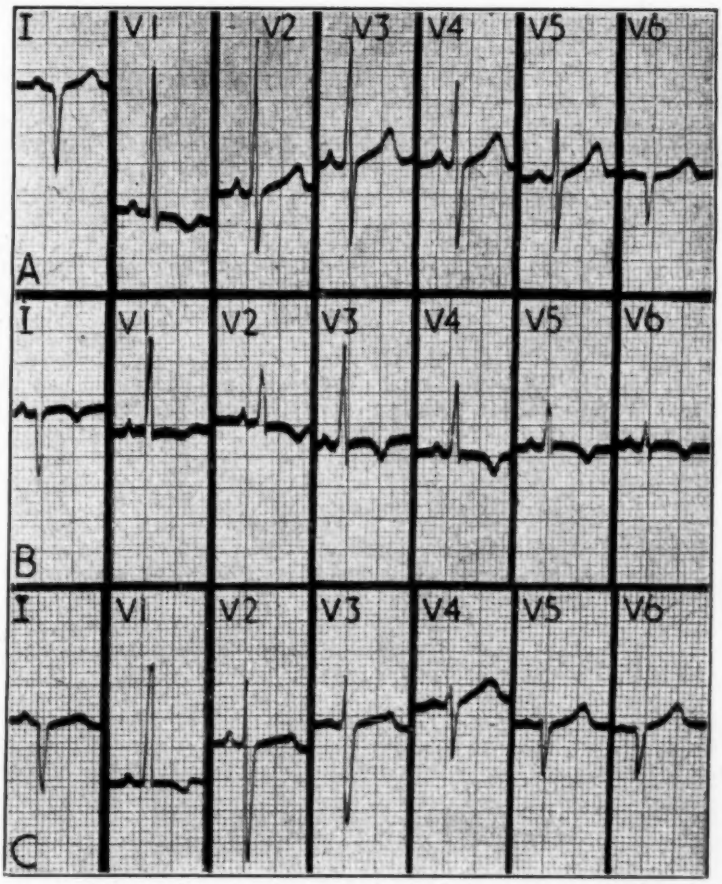

FIG. 7.—Characteristic T-wave changes in leads I and V_2 to V_6 after infundibular resection and valvotomy. (A) Before operation with right ventricular preponderance only. (B) Eighteen days after, showing T inversion in leads I and from V_1 to V_6. (C) Two years after, showing return towards normal, though in V_2 and V_3 T is still rather smaller and slow rising with a peak at the end. Case V65.

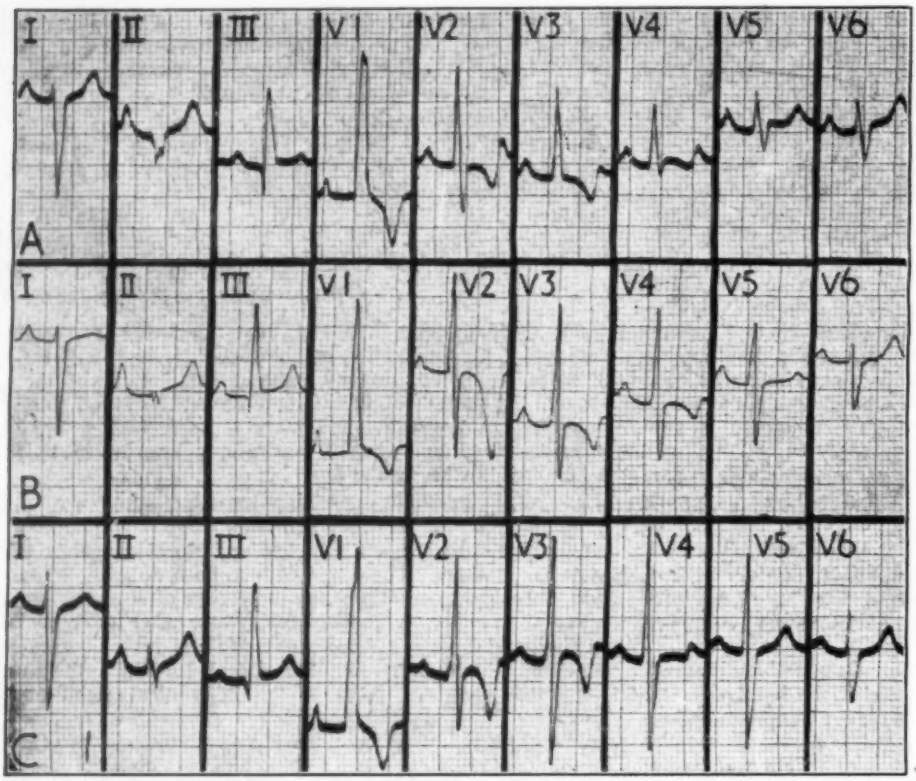

FIG. 8.—Diminution of T_1 and increased T inversion in the chest leads after infundibular resection, without much recovery two years later. (A) Before operation. (B) 21 days after infundibular resection. (C) 18 months after with recovery in V_4 only. Case V62.

Changes During the Operation

Continuous electrocardiograms have been taken during most of these operations and the findings have been described (Campbell and Reynolds, 1954). Changes in the pacemaker, nodal rhythms, A–V dissociation, ventricular extrasystoles, and short paroxysms of ventricular tachycardia were all common : heart-block and ventricular fibrillation were seen occasionally, but only rarely in patients who recovered. Apart from these changes of rhythm, bundle-branch block and S–T depression were common, but disappeared before the end of the operation or soon after. These changes have no direct relationship with the ones that follow the operation.

Early Changes after Operation

Brock and Campbell (1950b) described the changes that are generally seen after the right ventricle had been incised—changes similar to those seen after muscle injury. Subsequent records strengthen the view that these changes are a regular feature. For the first week after the operation no change is seen. Cove-shaped S–T waves with T inversion in lead I and reciprocal changes in lead III appear during the second or third week and increase in degree during the third and fourth weeks (Figs. 7 and 8, and Figs. 12 to 14 of Brock and Campbell, 1950b). During the fifth or sometimes not till the eighth week these changes are stationary. Thereafter, most often about the sixth or eighth weeks they gradually diminish, and have disappeared in the standard leads three or four months after operation. The inversion is greater (10 mm. or more) and lasts longest in the chest leads, especially V_2 and V_5, or even V_6. There are, however, no Q waves.

The more detailed findings on which these general conclusions are based follow. We have not many records taken early after operation, but 12 taken between 3 and 14 days after operation show no changes in the standard leads, though they may start earlier in the chest leads. There were 22 cases in which the changes were first seen in the second week, 15 in which they were seen in the third week, and 4 in which they were seen in the fourth week. The earlier dates are probably more accurate because usually there was no record to show that the change had not started sooner. T changes were still progressive during the third week in 12 and during the fourth week in 8 cases. Reversal of these changes and some return towards normal started in the fourth, fifth, or sixth week (seven cases), but more often in the seventh or eighth weeks.

All the 39 patients in whom records were available showed some of these changes. T_1 became smaller or flat in 10 but was not proved to become inverted, though it may have been at a time we had no records: in 6 of these 10, T was deeply inverted in the chest leads V_2 to V_4 or V_5, and in four it was biphasic.

Later Changes

These changes regress from the sixth to the eighth week after operation and generally disappear from the standard leads by three or four months. Occasionally T_1 may remain rather lower, but it has never remained flat or inverted for more than six months except in Case V 10, whose severe pain in the chest after operation seems likely to have been caused by a small cardiac infarct, though at the time it was attributed to a pulmonary embolism. Regression towards normal starts about the same time in the chest leads but is less often complete.

Recovery was nearly complete in 20 or 42 patients from two to four years after operation, though sometimes the T waves were smaller in leads V_2 and V_3. In 22 there were persistent changes, T in V_2 and V_3 and sometimes V_4 remaining inverted (nine cases) or biphasic (six cases) or slow-rising with a late peak (four cases). Some of the T waves are very similar in shape to those described by Evans and McRae (1952) as the lesser cardiographic signs of cardiac pain, and the late-rising peaked T wave is similar to the notched T waves (Dressler *et al.*, 1951). In the last three of the 22 patients the persistent changes were more severe. In Case V3, recovery was complete two years after operation, but five years after, when she was leading an active life almost without symptoms or undue enlargement of the heart, T had become deeply inverted from V_1 to V_4 (Fig. 9): there was no significant change in the standard leads. In the other two, also very good results, the T inversion has shown little tendency to disappear. In Case 2 T was still deeply, instead of slightly, inverted in V_1 to V_3, and flat in V_4 four years after operation, though the standard leads had returned to normal (Fig. 10). In Case 7 the chest leads had recovered at eight months, but three years after operation, when he had increased his activity greatly and was thought to have been doing too much, his heart was too large and T was inverted from V_1 to V_3 (Fig. 11). Here, too, the post-operative changes have disappeared, but evidence of right ventricular strain is developing. Clinically these three patients have achieved very good results, but the deep T inversion in the chest leads is disappointing; although at present it is not reflected in any clinical signs, it must be unfavourable for prognosis.

T-wave Changes after Anastomotic Operations

These late changes after direct operations have led us to re-examine the records after anastomotic operations, although earlier (Baker *et al.*, 1949) we had not been impressed by any cardiographic changes. A certain number of records three to six years after a subclavian–pulmonary anastomosis do show similar late changes. Of 42 early cases, unselected except that only good results were included, there were nine in which T was inverted from V_1 to V_3 and often to V_4, and in nine it was somewhat biphasic in V_2 and V_3. In the remaining 24 there was no change, though, of course, they still show right ventricular preponderance. These proportions are not very different from what has been found after direct operations.

Increasing right ventricular strain and T inversion might perhaps be expected in the most successful cases in which the degree of activity, the pulmonary blood flow, and the size of the heart show the greatest increase. There was some correlation, but it was not very close. In 6 of the 17 with inverted or biphasic T waves the heart was larger than was usual, but this was not so in the remaining 11. In two of the three with the greatest degree of inversion among the patients who had direct operations the heart was also unusually large, but not in the third. However, among the other 11 with inverted or biphasic T waves there were only two in whom it was larger than was usual.

It looks as if a successful result with a much increased pulmonary blood flow and a capacity for a much more active life is a partial but by no means the whole explanation of these cardiographic changes, as it is with an undue increase in the size of the heart.

Results of Cardiac Catheterization after Operation

Cardiac catheterization has a more useful place in assessing the results after direct than after anastomotic operations, and it has been carried out on selected cases to show the haemodynamic changes which are summarized in Table VI. We have not, however, used it as a routine to assess the results of the operation, for this is best done by clinical judgment of the patient's increased capacity.

The degree of change observed correlates well with the subjective improvement noticed by the patient. Where the operation has produced obvious benefit the right-to-left shunt is generally found to be reduced. This is shown by reduction of the cyanosis and by increase of the arterial O_2 saturation from an average of 78 to 91% and in three cases to normal values of 95% or above, a figure rarely, if ever, reached after anastomotic operations.

The pressure relationships between the right ventricle, the aorta, and the pulmonary trunk are not much changed. In Fallot's tetralogy the right ventricular systolic pressure tends to be fixed near the systemic arterial level because of the ventricular septal defect and overriding aorta. It is perhaps more surprising that the pulmonary pressure is not raised after partial relief of the stenosis and the increased pulmonary flow. It is well known that the pulmonary arterial pressure is largely independent of the pulmonary blood flow, but relief of the valvular stenosis might allow the high right ventricular pressure to be transmitted to the pulmonary trunk, and this has been urged as a criticism of direct operations. In fact, the average pulmonary pressure was 16/6 before and 14/4 mm. Hg after operation (excluding Case 21): the stenosis has been relieved enough to increase the pulmonary flow but not enough to lead to an equalization of systolic pressures.

Calculation of systemic and pulmonary blood flows is less accurate than the preceding figures but gives a good guide to the changes. The systemic flow is on the average unchanged. This is as one would expect, for in most forms of congenital heart disease the systemic blood pressure and flow appear to be maintained near normal and to be independent of changes in the pulmonary circulation (Deuchar and Knebel, 1952). The average pulmonary flow, on the other hand, is increased from 3.1 to 4.9 litres. If it is expressed as a percentage of the systemic flow it is increased from about half to about the same as the systemic flow; this high average covers a wide range and includes the very large—sometimes too large—pulmonary flows in the four patients with the most striking changes after operation.

The findings in these four with extremely good functional results are of great interest (Cases V35, 7, V54, and 21; see Table VI). The right-to-left shunt has been not merely

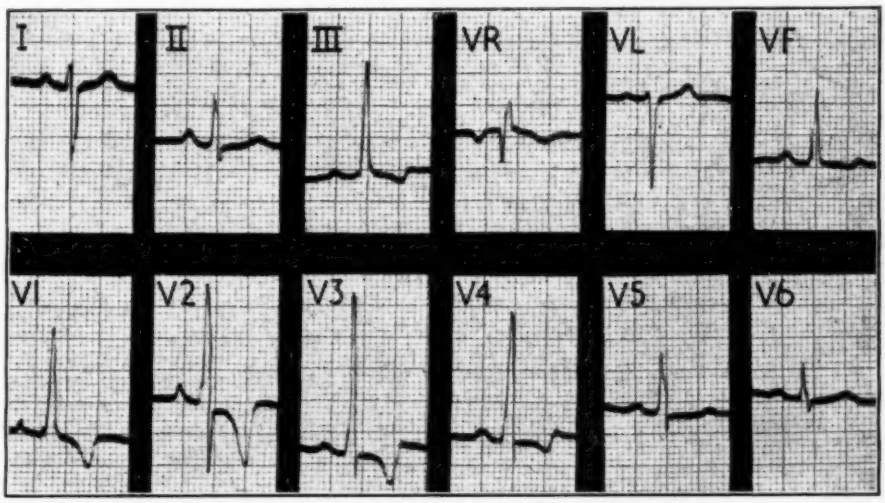

FIG. 9.—Increasing right ventricular strain five years after pulmonary valvotomy for Fallot's tetralogy. Two years after operation there was no more than right ventricular preponderance. Now, although she is very fit and leading an active life, the T waves have become deeply inverted in V_2 to V_5 and biphasic in V_6. Case V3.

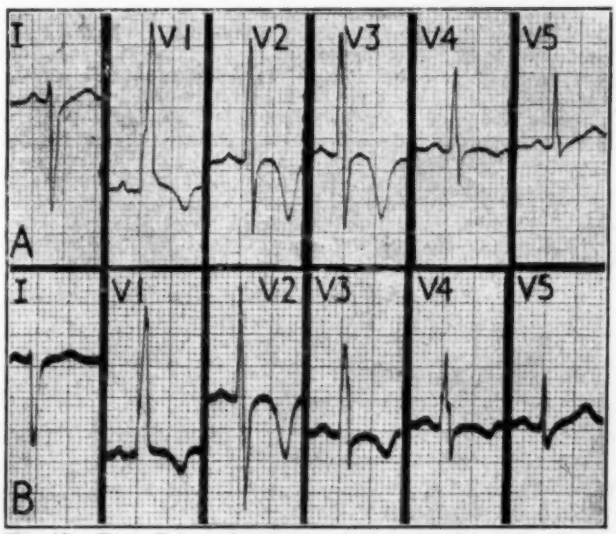

FIG. 10.—Deep T inversion in the chest leads after infundibular resection that changed only slightly during the next four years. (A) A year after, there is much more T inversion in the chest leads to V_1 to V_4 than before operation or even a month after it. (B) Four years after, T is still inverted from V_1 to V_4 but the very deep inversion is only seen in V_2. Case 2.

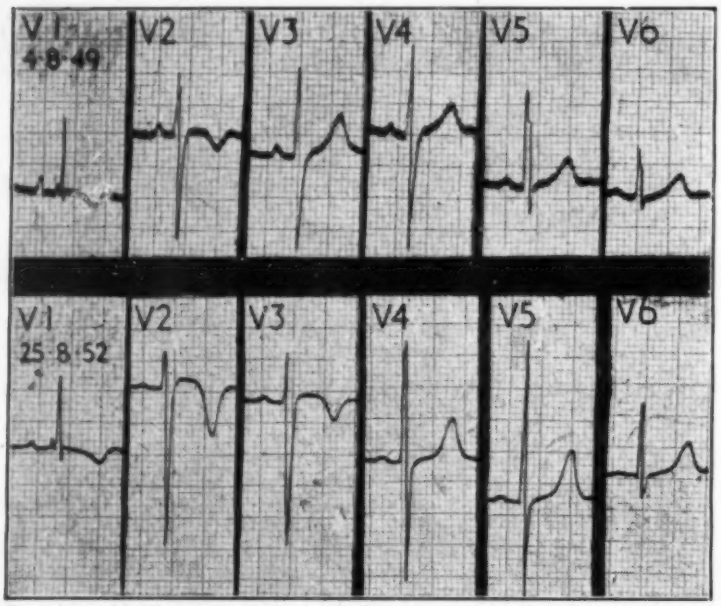

FIG. 11.—(A) Six weeks after infundibular resection the typical changes were limited to V_5. (B) Three years afterwards T was much more deeply inverted in V_5 and V_6. Case 7.

reduced but replaced by a left-to-right shunt, as shown by a normal arterial oxygen saturation and a pulmonary blood flow now in excess of the systemic. This must be determined by the relative resistance of the aortic and pulmonary outflow tracts, for the operation cannot have altered the anatomical relation between the root of the aorta and the ventricular septum. Clearly, the operation reduces the resistance to the pulmonary flow so that a larger proportion of the combined ventricular output goes to the lungs. In extreme cases the effect is seen not merely as a reduction of, but as a complete reversal of, the usual right-to-left shunt. Even then there was only one patient in whom the much larger pulmonary flow was associated with any significant rise in the pulmonary arterial pressure. Short notes about her follow.

Case 21, aged 16, had Fallot's tetralogy with moderate disability and cyanosis. Infundibular resection was performed successfully, but almost at once ventricular fibrillation occurred: resuscitation restored normal cardiac activity, and it was then obvious that the shunt had been completely reversed, for the pulmonary trunk was distended and the peripheral blood pressure was very low. Constriction of the pulmonary trunk by the surgeon's finger reduced the pulmonary flow and improved the systemic flow with a corresponding rise in the blood pressure. The operation was followed by initial right heart failure, but this responded to treatment.

Functionally the result was excellent and within six months the patient had walked eight miles and had (without approval) cycled from Winchester to London and back again in a day. The only disquieting feature was an increase in the c.t.r. from 49 to 68% (Fig. 6), but this diminished later. Cardiac catheterization showed that the shunt was completely reversed (arterial O_2 saturation 98% instead of 86%), so that the pulmonary flow was now more than twice as large as the systemic, instead of being about half as large. The pulmonary arterial pressure was increased from 14/7 to 38/12 mm. Hg. In the light of what was seen at operation this probably represents a maintenance of pulmonary peripheral resistance as a means of preserving an adequate systemic circulation when the pulmonary stenotic resistance has been greatly reduced. The pulmonary pressure may possibly rise further, even enough to cause a reversal of the shunt again, but this seems unlikely.

One other patient of Dr. Paul Wood's operated on at the Brompton—one of four who have had catheterization after operation—showed very similar changes. The clinical result was good and the arterial O_2 saturation was increased from 87 to 96%, but there was a left-to-right shunt of 5 litres. The systolic pressure in the right ventricle was lowered by only 5 mm., but the pulmonary arterial pressure rose from 12/3 to 38/20 mm. Hg. A second also had a moderate left-to-right shunt without an undue increase in the pulmonary arterial pressure (25/12), but for some reason the O_2 saturation in the peripheral artery and in the pulmonary vein was recorded as 88%. In the other two the results were substantially the same as those shown in Table VI; the arterial oxygen was higher but not normal, and the pulmonary arterial pressure was still low in spite of the increased pulmonary flow.

Discussion

Inevitably there must be some comparison between anastomotic and direct operations. The former follow the sound physiological principle of increasing the blood flow to the lungs because this is defective. The latter follow the sound surgical principle that an obstruction should be relieved as directly as possible and have the added advantage that they reduce the right-to-left shunt.

The excellent results of anastomotic operations led to their rapid and wide acceptance, all the more so as at first there was no alternative: they still seem to be preferred by most surgeons. Since that time safe intracardiac surgery has established itself as a daily routine, and in many countries vigorous efforts are being made to develop this new therapeutic weapon as quickly as possible.

The direct operations, although often approved in principle, have not been practised in large numbers. Most surgeons and cardiologists are still reluctant to accept them, because they fear a high mortality, distrust what they call a "blind operation," and are not convinced that good results can be achieved. An overall mortality of 15% is not unreasonable and certainly not prohibitive, for it is no higher than that found in the earlier series of anastomotic operations. Good results can be expected in most cases, as shown by the figures that have been given.

TABLE VI.—*Results of Cardiac Catheterization in Fallot's Tetralogy After Direct Operations*

Case No.	Sex and Age	Type of Stenosis	Condition after Operation	Pressure: mm. Hg from Mid-axillary Line				Systemic Blood Flow (litres/min.)		Pulmonary Blood Flow						Arterial Oxygen Saturation	
				Right Ventricle		Pulmon. Trunk				(litres/min.)		Litres/ sq.m./min.		As Percentage Systemic Flow			
				Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After
V24	M11	Inf.+V.	No change	81/4	92/2	14/0	10/4	—	4·0	—	2·9	—	2·2	—	73%	88%	87%
V67	M19	V.	Improved	82/0	80/–2	13/4	10/0	7·0	8·1	3·6	6·1	2·2	3·2	51%	75%	82%	89%
V4	F23	V.	"	53*	40*	13*	11*	—	—	—	—	—	—	—	—	77%	88%
V32	F18	V.	Very good	36*	33*	9*	7*	4·3	7·7	2·2	3·4	1·5	2·3	51%	48%	69%	84%
V29	F17	V.+Inf.	"	—	110/0	—	12/3	—	4·4	—	2·9	—	2·1	—	66%	—	85%
8	F20	Inf.	"	100/6	106/2	12/6	12/4	4·0	3·4	2·5	2·6	1·7	1·8	62%	80%	74%	86%
V10	M22	V.	"	45*	100/8	16*	17/2	5·1	3·7	2·1	3·2	1·5	2·2	39%	87%	79%	92%
3	M24	Inf.	"	—	85/10	—	28/4	—	4·0	—	4·8	—	2·9	—	120%	75%	90%
V35	M14	V.	"	103/0	88/4	16/7	24/9	5·1	4·5	2·8	6·2	1·9	4·2	55%	138%	81%	93%
7	M12	Inf.	"	85/0	145/5	—	18/7	—	3·6	?	5·6	?	3·9	30%	156%	72%	95%
V54	F14	Inf.+V.	"	132/11	116/0	27/13	15/5	7·3	5·2	5·2	7·9	3·3	5·1	34%	152%	87%	97%
21	F16	Inf.	"	114/?	100/5	14/7	38/12	—	3·6	?	7·5	?	6·2	57%	208%	86%	98%

* Mean pressures.

Our present technique, although admittedly restricted and not "open," is certainly not "blind." By complete exposure and external examination of the heart and great vessels at operation a high standard of diagnosis is reached, and is both amplified and verified by direct pressure readings made in the various parts of the pulmonary outflow tract. In this way the presence of one or two stenoses and their exact level and relative importance can be accurately and quickly assessed. When necessary a finger is introduced into the right ventricle and further information is obtained. The obstruction or obstructions are then relieved by a simple technique consisting of incision and splitting the stenosed valve and punch resection of the infundibular stenosis. Not until electromanometric records show that the stenosis has been adequately relieved is the operation concluded. This may involve the introduction of instruments ten or twelve times. Our present technique has evolved from the experience gained in over 100 direct operations of this type and explains why the results, both in low mortality and in good function, are better now than formerly. Failures to-day are rare and some of the earlier ones were due to lack of skill in doing the operation well or in recognizing the presence of infundibular stenosis when valvular stenosis had been relieved.

The right-to-left shunt can be lessened or corrected or even overcorrected. We have ample evidence of this clinically and from cardiac catheterization. The shunt is changed as a result of the lessening of the pulmonary stenosis, and as more blood goes to the lungs less is diverted into the aorta. Indeed, without careful electromanometric control throughout the operation it is easy to relieve the stenosis too effectively and thus cause a left-to-right shunt and too large a pulmonary blood flow. With a bolder attack on the stenosis it has been increasingly important to try to avoid overcorrection, and in some cases we have done too much. This, again, has been put forward as an objection to the direct operation, that one would produce an Eisenmenger's complex. So far this has not occurred, although occasionally the pulmonary blood flow has been increased too much (as, indeed, it may be after an anastomosis). Here again we are dealing only with a technical problem, albeit a big one, and not a principle. In contrast it seems that some surgeons do not use careful electromanometric control in these operations and so may give incomplete relief of the stenosis—often only introducing and withdrawing rapidly a single instrument. They do not check the final pressure changes. In our practice to-day the direct operations are reasonably efficient from the technical point of view but are not complete or entirely satisfactory. We think that the principle behind them—namely, relief of the obstruction—is a sound one, that technical limitations are temporary and can be conquered, and that the only thing that could prevent their development and wide acceptance would be a failure of technical improvement. The next and imminent advance in cardiac surgery is the establishment as a safe routine of direct vision operating within the "dry" heart. We have already found in patients operated on since this series that by this technique and using hypothermia the obstructions can be quickly located by sight and relieved under direct vision. The same principles obtain; their technical achievement is simply to be more effective.

These practical considerations do not present the whole story of direct relief of pulmonary stenosis in Fallot's tetralogy. There is the principle behind the direct operations which attempt anatomical relief of the obstruction. By this two things are achieved—an increase of blood flow to the lungs and a physiological correction of the right-to-left shunt. It does nothing anatomically to the ventricular septal defect or the overriding aorta. The fear of overcorrection of the shunt and the blood flow to the lungs is determined by our present technical inability to correct the ventricular septal defect and the overriding aorta. Once it becomes possible to achieve this, the objection to a too generous relief of the stenosis falls to the ground.

Admittedly, the closure of the septal defect is a difficult technical step and one that may often be unattainable. Equally certainly it must and will be achieved in many cases, and we shall then move nearer to our ideal of trying to correct the whole of the cardiac abnormality; we shall be able to tell some of our patients that they have in truth been cured and that their heart is now as near normal as may be. We shall be relieved of the uncertainty of the later prognosis that must obtain when the septal defect persists and a shunt is still present (after either a direct or an indirect operation), and when the heart may become too large, as has been found sometimes after both types of procedure. However, if we are to draw nearer to this ideal and if we are ever to achieve it, we can never do so by using only the anastomotic operations, but must use and develop the direct operations: herein lies a further justification for their use even though they may carry with them greater anxiety and responsibility in the course of their application and evolution.

Summary and Conclusions

We have reported the results in 100 patients with Fallot's tetralogy operated on by Brock's direct methods. Forty-five had infundibular resection only; all the others had pulmonary valvotomy, but 18 needed infundibular resection as well. We have re-examined and analysed most fully the first 61 who were operated on at Guy's Hospital, and have assessed the degree of improvement in the same way as in the parallel series of patients who had anastomotic operations, almost always subclavian–pulmonary anastomosis.

Both these direct operations can produce excellent results which last at least for the period of observation and seem likely to last much longer, judging by the present condition of the patients. Two-thirds of them have obtained good or very good results, which means that they are leading a quiet life that is nearly normal. One-sixth show some improvement but nothing like the standard of the good results. The remaining sixth died as the result of the operation.

In most particulars there was not much difference between the results of these two operations for Fallot's tetralogy, but valvotomy, with a gross mortality of 11%, seems reasonably safe, and infundibular resection, with, as might be expected, a higher mortality of 18%, seems more dangerous. Another difference is that infundibular resection rarely fails to produce a good result in those who survive, while after valvotomy, alone or combined, there are a larger proportion who show only slight or moderate improvement. Sometimes one cannot be sure of the degree of improvement at first, and we have been disappointed when the patient left hospital, only to find six or twelve months later that he had obtained an excellent result: this, however, is not usual.

The improvement in what these patients can do is as great as after anastomotic operations. In addition, there is the same reduction in their cyanosis and in the polycythaemia and haemoglobin percentage, the mean in those with good and very good results falling from 128 to 103%. The improvement in the colour and in the clubbing of the fingers may be even greater than after anastomotic operations, and some patients lose all their cyanosis at rest and a few even after exertion. In these, catheterization shows that the oxygen saturation of the arterial blood has become normal and that their right-to-left shunt has been not only diminished but reversed.

The heart tends to become larger after direct as after anastomotic operations, the cardiothoracic ratio rising from a mean of about 49 to 53.5% within a few months of operation and remaining at or a little below this level during the next few years. When the clinical result is particularly good and the cyanosis is abolished, the heart may increase in size more than usual, as after an unusually large anastomosis. It would be optimistic to expect the improvement that follows either of these operations without some increase in the size of the heart, because the right ventricle is still working against the systemic pressure and the patient is leading a much more active life. It means that in the patients with the best results the doctor should act as a restraining influence, persuading them to lead a reasonably quiet life if they wish to keep their improvement as long as possible.

It has been suggested as a criticism that direct relief of the stenosis will raise the pulmonary pressure and produce a condition like Eisenmenger's complex. This is not so. Even when the blood flow to the lungs is greatly increased and the patient can do much more, the stenosis has not been relieved so completely that the high pressure of the right ventricle is transmitted to the pulmonary trunk. In most cases, although the larger pulmonary flow and the condition of the pulmonary artery felt at operation and seen on radioscopy all show that the obstruction is less, catheterization shows that there is still a large pressure gradient across the site of the stenosis. In one patient only—one who can do all she wants and is acyanotic, with her right-to-left shunt reversed—there is some rise of pressure in the pulmonary trunk, but the increase is not very great.

The striking improvement as the result of increasing, directly or indirectly, the blood flow to the lungs has perhaps overemphasized the stenosis and drawn attention away from the ventricular septal defect and the overriding aorta. The improvement in the cyanosis shows that the venous shunt to the aorta is much less, and this has been confirmed by catheterization in several cases, though, of course, the pressure in the right ventricle remains about the same. But, so long as the ventricular septal defect remains, the right ventricle will have increased work and will be exposed to the risk of strain.

Future difficulties, however, are no reason for withholding the great advantages that anastomotic and direct operation can give, though clearly the treatment of Fallot's tetralogy will not be ideal until the ventricular septal defect can be closed.

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REFERENCES

Baker, C. G., Brock, R. C., Campbell, M., and Suzman, S. (1949). *Brit. Heart J.*, **11**, 170.
Brock, R. C. (1948). *British Medical Journal*, **1**, 1121.
—— (1949). Ibid., **2**, 399.
—— and Campbell, M. (1950a). *Brit. Heart J.*, **12**, 377.
—— —— (1950b). Ibid., **12**, 403.
Campbell, M. (1948). *Guy's Hosp. Rep.*, **97**, 1.
—— and Deuchar, D. (1953). *British Medical Journal*, **1**, 349.
—— and Hills, T. H. (1950). *Brit. Heart J.*, **12**, 65.
—— and Reynolds, G. (1954). Ibid., **16**, 57.
Connolly, D. C., Lev, R., Kirklin, J. W., and Wood, E. H. (1953). *Proc. Mayo Clin.*, **28**, 65.
Deuchar, D. C., and Knebel R. (1952). *Brit. Heart J.*, **14**, 225.
Dressler, W., Roesler, H., and Lackner, H. (1951). Ibid., **13**, 496.
Evans, W., and Macrae, C. (1952). Ibid., **14**, 429.
Goodwin, J. F., Steiner, R. E., Mounsey, J. P. D., MacGregor, A. G., and Wayne, E. J. (1953). *Brit. J. Radiol.*, **26**, 161.
Jönsson, G., Brodén, B., and Karnell, J. (1953). *Acta radiol., Stockh.*, **40**, 547.
Lowe, J. B. (1953). *Brit. Heart J.*, **15**, 319.
Taussig, H. B., and Bauersfeld, S. R. (1953). *Ann. intern. Med.*, **38**, 1.

SOME NEUROPHYSIOLOGICAL ASPECTS OF SEROTONIN

BY

D. W. WOOLLEY, M.D., Ph.D.

AND

E. SHAW, Ph.D.

From the Rockefeller Institute for Medical Research, New York

During the past few years a number of investigations have revealed that serotonin is of importance in the functioning of the autonomic and central nervous systems, and that the neurogenic behaviour of animals can be profoundly influenced by pharmacological agents which interfere with the action of this compound. The purpose of this paper is to summarize several of these findings.

The existence of serotonin was discovered only a few years ago as a result of two quite independent lines of work. Rapport, Green, and Page (1948) attempted the isolation of the vasoconstrictor which has long been known to form in mammalian serum when blood clots. They succeeded in crystallizing the substance present in serum which exerted this effect on the vascular bed and named it "serotonin." Rapport (1949) continued the study of the chemical nature of the active substance, and was able to deduce that it was 5-hydroxytryptamine (see Fig. 1). The correctness of this formulation was confirmed by Hamlin and Fischer (1951) and by Speeter *et al.* (1951), who synthesized 5-hydroxytryptamine and showed that it was identical with the naturally occurring substance.

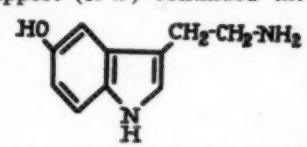

FIG. 1.—Structure of serotonin.

While the work on the identification of the vasoconstrictor of serum was being done, Erspamer (1940), in Italy, had been investigating a constituent of animal tissues which he had named "enteramine." This material occurred in gastric and enteric mucosa of mammals, and in the skin and salivary glands of such lower forms as toads, salamanders, and octopi (Erspamer, 1952; Erspamer and Vialli, 1952). The distinctive staining properties of the argentaffin cells of gastric mucosa were attributed to this substance, and these staining properties were used to follow it in early attempts at isolation. Pharmacological properties of crude extracts containing enteramine were found in that such extracts caused various smooth muscles to contract. Such properties led Erspamer to the view that the active agent was a hormone. Using pharmacological tests and colour reactions as guides, Erspamer and Asero (1952) were able to isolate a pure compound from the salivary glands of the octopus. This compound was found to be 5-hydroxytryptamine, identical with serotonin.

Action on Smooth Muscle

The early work on serotonin, or enteramine, had clearly indicated that it caused smooth muscles to contract. As soon as abundant material became available through chemical synthesis a variety of pharmacological effects of it began to be reported. Thus, segments of carotid arteries of sheep (Reid and Rand, 1952; Woolley

and Shaw, 1952, 1953a) or intestinal strips or isolated uteri of rats or of guinea-pigs (Erspamer, 1952) were made to contract when exposed to serotonin in minute concentrations (0.2–0.02 μg. per ml.). The history of serotonin as a vasoconstrictor has prompted a large number of studies with it in whole animals. One would expect it to cause a rise in blood pressure as a result of a decrease in the internal diameter of the blood vessels, and, in fact, in some species it does act as a pressor agent. Thus in dogs (Page, 1952; Freyburger *et al.*, 1952; Woolley and Shaw, 1953b) or in man (Page and McCubbin, 1953) the intravenous injection of serotonin leads to a sharp rise in blood pressure. The effect in dogs, however, is biphasic. Usually, but not invariably, the arterial pressure falls for a period of 10–20 seconds following the intravenous installation, and then the rise ensues. With small doses (e.g., with 10 μg. per kg.) one may see only the fall. In cats the fall in pressure is more prominent than the rise (Page, 1952; Freyburger *et al.*, 1952; Reid, 1952).

Several explanations have been advanced for the biphasic nature of the changes in blood pressure elicited by serotonin, but the one which seems best suited to the findings, and which will serve to introduce us to serotonin in neurophysiology, is derived from the work of Page (1952). He found that the fall in pressure was abolished by vagotomy, or by pharmacological blockade of the autonomic nerves with drugs such as tetraethylammonium chloride or atropine. In animals so treated, intravenous serotonin called forth only a rise in blood pressure. Furthermore, such animals were affected by considerably smaller amounts of serotonin (Page and McCubbin, 1953).

It would seem that the injection of serotonin into the blood stream sets up a reflex stimulation which then appears as a compensatory vasodilatation possibly directed towards the maintenance of normal pressure. When this stimulation is large or progressively increasing as in the intravenous injection experiments, the reflex vasodilatation overcompensates and one sees the transient fall in pressure. However, this compensatory mechanism has a limit and if the quantities of serotonin are large enough to evoke much contraction of the smooth muscles of the vascular bed it is obliterated and one sees the rise in pressure as a result of these contractions.

Direct evidence for the initiation of a nerve impulse was obtained by Schneider and Yonkman (1953). They succeeded in recording prolonged electrical discharges in the vagus of cats injected intravenously with serotonin. The locations of the receptors which initiate such nerve impulses are not entirely settled, but it is clear from the work of Page (1952) that they are not uniformly distributed in the body. Present evidence (Comroe *et al.*, 1953; Dawes, 1953; Ginzel and Kottegoda, 1954) suggests that there are such receptors in the carotid sinus, the lungs, and the heart. Possibly the excitation arises from the initiation of contraction of the muscles in the vessel walls as serotonin reaches them, but more probably the hormone actuates these special receptors in distinctive positions in the circulatory system.

Functions in the Nervous System

We emerge now from a brief consideration of the effects of serotonin on smooth muscles to an examination of it in the nervous system. The evidence collected thus far is of three kinds: (*a*) serotonin occurs in the brain, and in stellate and other visceral ganglia. In some of these sites it occurs in surprisingly high concentration. (*b*) Stimulation of certain peripheral nerves leads to the release from the brain, and in other experiments from ganglia, of a substance which appears to be serotonin. This substance then acts on target organs such as the heart. (*c*) Some specifically acting drugs have been discovered which antagonize the action of serotonin on smooth muscles. These drugs cause mental aberrations in man and in laboratory animals.

The occurrence of serotonin in the nervous system is now well established. From the brains of dogs, Twarog and Page (1953) were able to obtain a substance which exhibited the pharmacological effects of serotonin. This material was extracted with organic solvents and separated from impurities by chromatography on paper. The isolated substance showed the pharmacological properties of serotonin, had the correct R_f, and gave the anticipated colour reactions. Amin, Crawford, and Gaddum (1953) also were able to adduce evidence for and to measure serotonin in various parts of the brain. In the stellate ganglia of several invertebrates Florey and Florey (1953, 1954) found a surprisingly large amount of serotonin, which was isolated by paper chromatography and identified. Similarly, Welsh (1954) was able to demonstrate serotonin in the visceral ganglia of the shellfish *Venus mercenaria*.

The functioning of serotonin in the nervous system is just now being discovered. Consequently, knowledge is fragmentary, but seems to portend a large number of subsequent investigations. It has been known for many years that the stimulation of the cut end of the vagus nerve may lead to the release of a pressor substance into the venous blood from the head. Taylor, Page, and Corcoran (1951) thought that this might be serotonin. Their experiment was as follows. Both vagi of a dog were cut and the spinal cord was destroyed below C 6. The venous return from the head of this dog was then conducted into a second dog through a connexion for cross-circulation. This second animal was to act as indicator. When the cut end of the vagus of the first dog was stimulated electrically the arterial pressure of the second, or indicator, dog rose. The stimulation of the vagus of the first dog had thus caused something to be released from its brain into the circulation, and this raised the pressure in the second dog. Taylor *et al.* felt that this substance might be serotonin, and for the following reason. The rise in pressure of the second dog was eliminated by the introduction of 1-hydrazinophthalazine. Prior experiments had shown that this same drug would prevent the rise in arterial pressure which is elicited by serotonin. The possibility that the pressor substance was adrenaline, *nor*-adrenaline, or angiotonin was excluded by use of appropriate drugs. There was no direct proof that it was serotonin.

An experiment of Welsh (1954) in the shellfish *Venus mercenaria* provided further evidence of a functional role for serotonin in the nervous system. The heart of *V. mercenaria* is accelerated by minute amounts of serotonin. This is best seen when an anti-acetylcholine is simultaneously employed to eliminate the retarding effect of this latter hormone on the heart rate. If now the visceral ganglion is stimulated electrically the heart rate is accelerated, just as it is by administration of serotonin. The acceleration could, of course, be due to many things, but a further experiment suggested that it was due to serotonin. The action of the excitor substance liberated from the ganglion by electrical stimulation was prevented by ergotamine. This drug was known from the prior work of Shaw and Woolley (1953) and of Fingl and Gaddum (1953) to be a specific antagonist of serotonin. Thus it would seem that electrical stimulation of the visceral ganglion leads to the release of serotonin, which shows itself by stimulation of the heart rate. The abundant occurrence of serotonin in the ganglia which was demonstrated would be consonant with such a view. The possibility that adrenaline was the active participant was eliminated by the demonstration that adrenaline did not affect the heart rate under the conditions used (cf. Twarog and Page, 1953).

Antimetabolites of Serotonin

The functional participation of serotonin in the brain, especially in certain mental processes, has been suggested as a result of pharmacological evidence (Woolley and Shaw, 1954). It is now being widely recognized (cf. Woolley, 1952) that some drugs owe their effects on living things to the fact that they are related in chemical structure to one or another of the hormones, vitamins, or other essential cell constituents, and that, by virtue of this relationship, they are able to block the specific action of the cell constituent. They thus produce a specific deficiency of the hormone to which they are related. Such drugs are called antimetabolites. Some of them have been formed synthetically by changing slightly the chemical structure of a given hormone or vitamin. Others have been recognized to occur in nature among the host of drugs of plant and animal origin. In these latter the structural analogy to the target hormone or vitamin is generally less clear than among the synthetic antimetabolites. The natural products are usually more complex derivatives.

Both synthetic and naturally occurring antimetabolites of serotonin have been found. Immediately after the final proof of structure of serotonin was announced, a programme for the elaboration of antimetabolites of it was begun in the belief that such agents would almost surely be useful in the fundamental studies of the action of this hormone, as well as practically in the pharmacological manipulation of its functioning. Several near relatives of serotonin, such as the one shown in Fig. 2 (Shaw and Woolley, 1954), were synthesized, and were demonstrated to antagonize the action of the hormone on various smooth muscles examined *in vitro* (Woolley and Shaw, 1952, 1953a). Some of these compounds were found to prevent the rise in blood pressure caused by serotonin in dogs (Woolley and Shaw, 1953b).

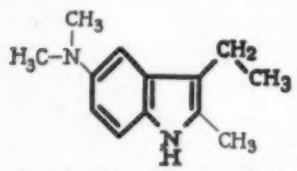

FIG. 2.—Structure of medmain.

Three classes of naturally occurring alkaloidal drugs were then recognized to be structurally related to serotonin, and were shown to be antagonized in their actions on smooth muscles by this hormone. These were the ergot alkaloids—for example, ergotoxine, ergotamine (Woolley and Shaw, 1953c; Shaw and Woolley, 1953; Fingl and Gaddum, 1953), lysergic acid diethylamide (Gaddum *et al.*, 1953)—the harmala alkaloids, such as harmine, or harmaline (Shaw and Woolley, 1953), and yohimbine (Shaw and Woolley, 1953). Structures of these compounds are shown in Fig. 3. Although these classes of alkaloids differ widely in chemical structure, they have in common an indole nucleus and a substituted aminoethyl side-chain which gives them all a resemblance to serotonin. They all act as competitive antagonists of serotonin on smooth muscles such as those in arteries.

They have a third feature in common. This is the ability of at least one member of each class to cause mental aberrations. Thus, the ergot alkaloid derivative lysergic acid diethylamide produces in man a transient state resembling schizophrenia (Stoll, 1947; Fischer *et al.*, 1951; Rinkel *et al.*, 1952; Hoch *et al.*, 1952). The harmala alkaloids bearing a methoxyl group cause hallucinations, and so disturb the mental processes of dogs that behaviour becomes noticeably changed. Crude yohimbine has long been known as an aphrodisiac. It has been suggested (Woolley and Shaw, 1954) that these mental changes may be the result of an interference with the action of serotonin in the brain. The drugs would thus be pictured as acting in the brain in a way comparable to that in which they act on various smooth muscles.

If this suggestion is correct, then other types of antiserotonins should cause mental disturbances. As a matter of fact, some of them do. Thus, l-hydrazinophthalazine has been reported to bring about psychiatric disease in a man treated with relatively large doses (Moser *et al.*, 1953). It will be remembered that Taylor *et al.* (1951) demonstrated an antagonism between this drug and serotonin, as measured by effects on the blood pressure of dogs. The simple synthetic analogue and antagonist of serotonin known as medmain (Shaw and Woolley, 1954) (Fig. 2) apparently exerts an effect on the central nervous system because it elicits profound convulsive fits in mice. No clinical experiences with this drug have been attempted.

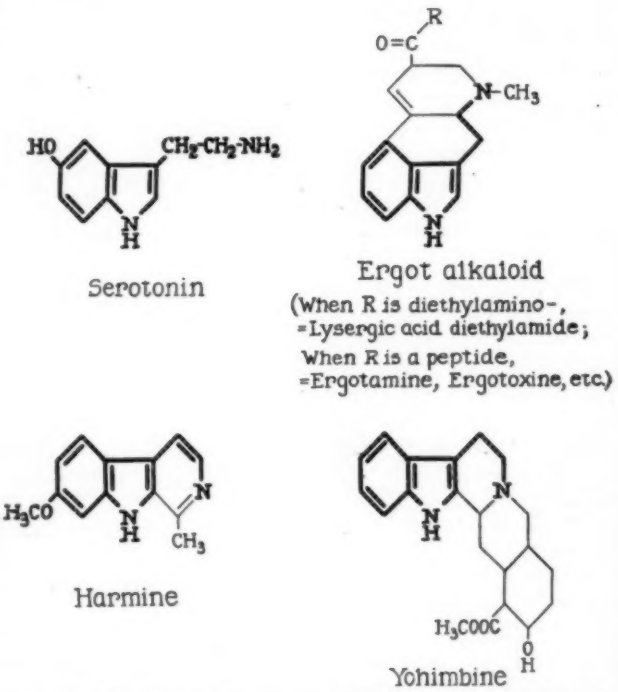

FIG. 3.—Serotonin and some naturally occurring psychogenic antiserotonins.

Do such findings permit one to conclude that the mental changes caused by the drugs are the result of an interference with serotonin? Two sets of experimental findings are against such a view. (*a*) Every antagonist of serotonin (as measured on smooth muscles) does not elicit the mental changes. Thus, although lysergic acid diethylamide does, ergotamine and ergotoxine do not. Medmain obviously affects the central nervous system of mice, producing convulsive fits, whereas 1-methylmedmain does not, even though it is equally potent as an antiserotonin on artery walls or uteri. (*b*) Serotonin should reverse the mental effects of the drugs. This has only been attempted in mice with medmain and with lysergic acid diethylamide, but in these cases serotonin failed to overcome the neurological effects of the drugs (Shaw and Woolley, 1954, and unpublished data). Clearly, the hormone can overcome the effects on smooth muscles, but not on the central nervous system.

In weighing this evidence one must remember the following points. Measurement of the increase in serotonin in the brain of a mouse injected peripherally with very large doses of this compound has shown that no detectable amount penetrated to the brain (Woolley and Shaw, 1954). Either the hormone did not find its way through the blood–brain barrier or else it was destroyed in the blood during transit to the brain. It is well known that the enzyme amine oxidase vigorously attacks serotonin, and that injected serotonin is rapidly cleared from the circulation. If serotonin itself finds difficulty in reaching the brain, then some of the antiserotonins may meet with similar difficulties. Presumably, only those antiserotonin drugs which penetrate to the proper place in the brain are able to cause the aberrations. This may aid in an understanding of why all compounds which antagonize the action of serotonin on smooth

muscles do not cause disturbances in the central nervous system. In any event, it seems clear that the direct introduction of serotonin, and of various antiserotonins, into the central nervous system will be needed if one is to settle this point.

Serotonin Deficiency

To Woolley and Shaw (1954) the findings with the drugs indicated that serotonin plays a part in the central nervous system in the maintenance of normal mental processes. The drugs may be pictured as acting by penetration to the brain and production there of a specific interference with these functions. A pharmacologically induced cerebral serotonin deficiency would thus be the cause of their psychotic effects—for example, the schizophrenia-like condition evoked by lysergic acid diethylamide. They have suggested that, if this view is correct, then naturally occurring psychiatric states such as schizophrenia might well be pictured as resulting from a deficiency of serotonin in the brain, brought about not by drugs but by failure of the metabolic processes which normally synthesize or destroy this hormone there. If this interpretation is correct, the trial of serotonin in practice for the treatment of these naturally occurring diseases would be suggested. However, because of the anticipated failure of peripherally administered serotonin to penetrate into the brain, it may be necessary to devise compounds with serotonin-like activity which can so penetrate.

It must be remembered that this opinion about a cerebral serotonin deficiency as the cause of conditions such as schizophrenia is a working hypothesis. Although one can demonstrate in smooth muscles a competitive antagonism between serotonin and the various drugs just discussed, there are other explanations which can be put forward for their psychotic effects. One of these is that the mental aberrations arise from an excess of serotonin rather than from a deficiency. Drugs such as the ergot alkaloids have been observed to cause inhibition of the enzyme amine oxidase (Orzechowski, 1941). This enzyme has been found in several tissues, including those of the nervous system (cf. Blaschko, 1952). It appears to be remarkably well constructed for the destruction of serotonin, although it will attack other amines such as adrenaline in a less vigorous fashion. If the amine oxidase of the brain were inhibited *in vivo*, as it is *in vitro*, by drugs such as have just been discussed, then an excess of the hormone would probably accumulate. The interference of these antiserotonin drugs would still be a consequence of their structural resemblance to serotonin. The difference would be that the competition with the hormone would be for the destructive functional site—that is, the enzyme amine oxidase—rather than for sites of action in the brain akin to those involved in the contractions of smooth muscles. Nevertheless, if cerebral amine oxidase were the chief serotonin receptor to be affected by the drugs in the brain, the result would be an excess of serotonin there, rather than a deficiency. In both situations the drugs would be acting as antimetabolites of serotonin, but the end-results would be quite different. In one case a deficiency and in the other an excess would appear.

Feldberg and Sherwood (1954) have quite recently provided experimental evidence of the behavioural effects of an excess of serotonin in the brain, and their results might tend to favour the hypothesis that the drugs act *in vivo* by allowing the accumulation of serotonin. In a cat provided with a permanently affixed cannula to facilitate painless injections into the lateral ventricle of the brain, Feldberg and Sherwood observed that the introduction of 100–200 μg. of serotonin resulted in several behavioural changes in the animal. These might be interpreted as being similar to some of the signs of clinical schizophrenia. For example, the lassitude and the willingness of the cat to remain in unnatural positions when so manœuvred by the experimenter might be likened to the catatonia seen in some human mental disorders.

It is clear that quantitative measurements of the serotonin levels in the cerebral fluids of mentally deranged patients, and of normal subjects, would be of much assistance at this time. The introduction of serotonin into the central nervous system of normal humans might also throw light on this problem, but the dangers of such an experiment are so plain that this course should not be pursued. It is one thing to administer the hormone peripherally, where it has been given to humans without serious consequences (Page and McCubbin, 1953; Reid, 1952), but it is quite another to introduce it directly into the central nervous system. Apart from these direct experiments, it would be well to know whether amine oxidase is in fact inhibited by each and every one of the drugs under discussion. The answer would help in choosing between the alternative hypotheses of deficiency or excess of serotonin as a causal factor in the aberrations.

If it should turn out that the accumulation of serotonin is the real difficulty in the drug-induced mental disorders, one might picture the naturally occurring diseases as arising from an excess of serotonin brought about by increased production or diminished rate of destruction. It would be possible to envisage the treatment of such a situation by the use of antimetabolites of serotonin so constructed as to be able to penetrate into the brain and not to interfere with the action of amine oxidase. Such compounds would exclude the excess serotonin from the postulated receptor sites which account for its functioning on nervous tissue. To envisage such an antimetabolite capable of inhibiting the action at the receptor site and yet not capable of inhibiting the normal destructive process for the hormone would be no different from the known situation with regard to acetylcholine. In that case drugs such as eserine inhibit the normal destructive process (choline esterase), whereas atropine and the curare-like agents introduce a block at the receptor site. There are now available antimetabolites of serotonin which have been shown to penetrate into the brain—for example, 1-methylmedmain (Shaw and Woolley, 1954).

A further objection to all of these points of view could be raised—namely, that the pharmacological and biochemical evidence is insufficient to justify any connexion of serotonin with the neurological effects. This point of view cannot be excluded. However, the combined evidence, both biochemical and pharmacological, seems to be sufficient to encourage pursuit of the working hypothesis that this hormone-like compound plays an important part in the functioning of the nervous system.

References

Amin, A. H., Crawford, T. B. B., and Gaddum, J. H. (1953). *Abstr. XIX int. Congr. Physiol.*, p. 165.
Blaschko, H. (1952). *Pharmacol. Rev.*, **4**, 415.
Comroe, J. H., Van Lingen, B., Stroud, R. C., and Roncoroni, A. (1953). *Amer. J. Physiol.*, **173**, 379.
Dawes, G. S. (1953). *Abstr. XIX int. Congr. Physiol.*, p. 51.
Erspamer, V. (1940). *Arch. exp. Path. Pharmak.*, **196**, 344.
—— (1952). *Ricerca sci.*, **22**, 1568.
—— and Asero, B. (1952). *Nature, Lond.*, **169**, 800.
—— and Vialli, M. (1952). *Ricerca sci.*, **22**, 1420.
Feldberg, W., and Sherwood, S. L. (1954). *J. Physiol.*, **123**, 148.
Fingl, E., and Gaddum, J. H. (1953). *Fed. Proc.*, **12**, 320.
Fischer, R., Georgi, F., and Weber, R. (1951). *Schweiz. med. Wschr.*, **81**, 817, 837.
Florey, E., and Florey, E. (1953). *Naturwissenschaften*, **15**, 413.
—— —— (1954). *Z. Naturf.*, **96**, 58.
Freyburger, W. A., Graham, B. E., Rapport, M. M., Seay, P. H., Govier, W. M., Swoap, O. F., and Vander Brook, M. J. (1952). *J. Pharmacol.*, **105**, 80.
Gaddum, J. H., Hebb, C. O., Silver, A., and Swan, A. A. B. (1953). *Quart. J. exp. Physiol.*, **38**, 255.
Ginzel, K. H., and Kottegoda, R. S. (1954). *J. Physiol.*, **123**, 277.
Hamlin, K. E., and Fischer, F. E. (1951). *J. Amer. chem. Soc.*, **73**, 5007.
Hoch, P. H., Cattell, J. P., and Pennes, H. H. (1952). *Amer. J. Psychiat.*, **108**, 579.
Moser, M., Syner, J., Malitz, S., and Mattingly, T. W. (1953). *J. Amer. med. Ass.*, **152**, 1329.
Orzechowski, G. (1941). *Arch. exp. Path. Pharmak.*, **198**, 27.
Page, I. H. (1952). *J. Pharmacol.*, **105**, 58.
—— and McCubbin, J. W. (1953). *Circ. Res.*, **1**, 354.
Rapport, M. M. (1949). *J. biol. Chem.*, **180**, 961.
—— Green, A. A., and Page, I. H. (1948). *Ibid.*, **176**, 1243.
Reid, G. (1952). *J. Physiol.*, **118**, 435.
—— and Rand, M. (1952). *Nature, Lond.*, **169**, 801.
Rinkel, M., DeShon, H. J., Hyde, R. W., and Solomon, H. C. (1952). *Amer. J. Psychiat.*, **108**, 572.
Schneider, J. A., and Yonkman, F. F. (1953). *Fed. Proc.*, **12**, 128; *Amer. J. Physiol.*, **174**, 127.

Shaw, E., and Woolley, D. W. (1953). *J. biol. Chem.*, **203**, 979.
—— —— (1954). *J. Pharmacol.*, **111**, 43.
Specter, M. E., Heinzelmann, R. V., and Weisblat, D. I. (1951). *J. Amer. chem. Soc.*, **73**, 5515.
Stoll, W. A. (1947). *Schweiz. Arch. Neurol. Psychiat.*, **68**, 279.
Taylor, R. D., Page, I. H., and Corcoran, A. C. (1951). *Arch. intern. Med.*, **88**, 1.
Twarog, B. M., and Page, I. H. (1953). *Amer. J. Physiol.*, **175**, 157.
Welsh, J. H. (1954). *Fed. Proc.*, **13**, 162.
Woolley, D. W. (1952). *A Study of Antimetabolites*. Wiley, N.Y.
—— and Shaw, E. (1952). *J. Amer. chem. Soc.*, **74**, 2948.
—— —— (1953a). *J. biol. Chem.*, **203**, 69.
—— —— (1953b). *J. Pharmacol.*, **108**, 87.
—— —— (1953c). *Fed. Proc.*, **12**, 293.
—— —— (1954). *Proc. nat. Acad. Sci., Wash.*, **40**, 228.

THE MANAGEMENT OF HAEMOLYTIC DISEASE OF THE NEWBORN

BY

WILLIAM WALKER, M.D.

Lecturer in Child Health, University of Durham

AND

SHEILAGH MURRAY, M.B., B.S.

Director, Regional Blood Transfusion Service, Newcastle-upon-Tyne

Haemolytic disease of the newborn can be predicted with certainty before delivery. The diagnosis can be established within minutes of birth, and with the use of exchange transfusion the mortality need only be of the order of 2% of live-born infants with this disease. Yet in England and Wales during 1952 the recorded mortality was 14%. This represents a loss of 435 lives in the year, but we believe that 367 of these infants might have been saved. This needless loss of a life each day constitutes a challenge we must not ignore.

Experience in the Northern Region, 1952–3

The purpose of this article is to describe our recent experience of this disease in the Northern Region, to serve as a basis for comparison. We deal mainly with 1952 and 1953 because it was only in late 1951 that spontaneous delivery and exchange transfusion was proved to be the treatment of choice for infants with this disease.

The management of haemolytic disease of the newborn in this region is based on the following facts, some of which are generally accepted, while others have emerged from our experience during the past six years: (1) At least 5 out of every 1,000 babies in the North of England will suffer from haemolytic disease of the newborn. (2) Of 100 such babies 10–15 will be stillborn. (3) Of 100 live-born babies with this disease, 60 will require transfusion sooner or later, while the remaining 40, being affected to a lesser degree, will survive without treatment. (4) For those requiring treatment, early exchange transfusion is superior to simple transfusion (Mollison and Walker, 1952). (5) Premature induction has no routine place in the management of this condition (Mollison and Walker, 1952).

Although blood-grouping tests will enable practically 100% of cases to be predicted antenatally, there are no reliable means of forecasting severity; therefore hospital delivery has been offered to all immunized Rh-negative mothers. Three outlying hospitals have provided for their immediate areas, while the Newcastle group of hospitals has provided for the remainder.

Points Considered

We have tried to judge the adequacy of the arrangements by considering the following points: (1) The number of cases of the disease predicted in relation to the number expected, which affords a measure of the completeness of antenatal supervision. (2) The selection of cases for treatment, on which will depend the ultimate prognosis for the affected infant. (3) The survival rate in affected babies, by which we may judge the efficiency of treatment.

Incidence

The variations in the incidence of haemolytic disease of the newborn in 1952 and 1953 are shown in Table I. In each year 25 of the expected 27 stillbirths were recognized. Table II shows that, as serological facilities become more generally used, so the incidence of haemolytic disease of the newborn apparently rises.

TABLE I.—*Variations in Incidence of Haemolytic Disease of the Newborn*, 1952–3

Area	Year	Total Births	Expected No. H.D.N.*	H.D.N. Diagnosed	Cases not Predicted		Incidence per 1000 Total Births
					No	%	
Northumberland	1952	13,399	67	73	—	—	5·4
	1953	15,022	75	61	14	19	4·0
Durham	1952	26,532	133	99	34	25	3·7
	1953	25,748	132	139	—	—	5·2
Cumberland† ..	1952	4,977	25	13	12	48	2·6
	1953	4,960	25	18	7	28	3·6
North Riding ..	1952	9,292	46	17	29	63	1·8
	1953	8,849	44	31	13	30	3·5

*Expected number of cases of haemolytic disease of the newborn calculated on an incidence of 5 out of every 1,000 total births.
†Although part of Westmorland comes within the Northern Region there is a tendency for cases to drain to hospitals outside this region. We have felt that any figures for this county could not be representative, and have therefore excluded them.

TABLE II.—*Variations in Incidence of Haemolytic Disease of the Newborn Per* 1,000 *Total Births*, 1948–53

Area	1948	1949	1950	1952	1953
Northumberland	3·5	4·7	5·8	5·4	4·0
Durham	1·6	2·5	3·5	3·7	5·2
North Riding	0·4	1·7	1·5	1·8	3·5
Cumberland	0·75	2·1	1·7	2·6	3·6

In 1952 75 cases were missed, while 34 were missed in 1953. We assume that, although some of these infants would be stillborn and others so mildly affected as to require no treatment, lives have been lost unnecessarily.

Unfortunately, only 75% of cases in 1953 were predicted antenatally, the remaining 25% being diagnosed only after delivery. Of the 49 Northumberland and Durham cases not predicted, 42 were because of failure to test for antibodies between the 32nd and the 36th week of pregnancy. Technical error and the presence of rare antibodies accounted for only four and three cases respectively. Unaccountably, a number of mothers had been tested in one or more previous pregnancies, yet not in the current one.

Northumberland and Durham

Northumberland and Durham (including Newcastle and Tyneside, but excluding Sunderland and Stockton) are regarded as one area because in the two years under review all women resident here and found by routine antenatal tests to be "Rh-negative with antibodies" were offered delivery in one of the Newcastle group of hospitals. In each year four mothers, although living in the North Riding of Yorkshire, were delivered in a Newcastle hospital, and these cases are considered here.

Method of Treatment.—Where treatment was indicated we have used exchange transfusion, performed within nine hours of birth. By the umbilical vein route we have aimed to exchange 80 ml. per lb. (176 ml. per kg.) body weight,

using blood concentrated so as to have a haemoglobin value of approximately 17 g.%. There were no technical failures in 1952 and 1953.

Selection of Cases for Treatment

We have found that the haemoglobin and bilirubin levels in cord blood provide reliable criteria of severity, enabling one to select, within an hour of birth, practically all infants requiring treatment. Obviously some babies are so seriously affected that to await the results of laboratory tests is not only unnecessary but may be dangerous.

Since late 1951 the following have been our indications for exchange transfusion, and we think they apply to both mature and premature infants: A Coombs-positive baby with a cord Hb level of 14.8 g.% or less, and a cord Hb level of 14.9 to 17.7 g.% associated with a bilirubin level greater than 2.7 mg. per 100 ml. No infant with a cord Hb of more than 17.7 g.% has received exchange transfusion.

In our early experience cord-blood samples were often unsatisfactory because of errors in collection. With practice, satisfactory specimens can be collected with certainty, as illustrated by the following facts. In one hospital, 152 ideal specimens were collected from 159 live-born affected infants—that is, 96% of cases. Contrast this with 70 babies born in other hospitals. Ideal specimens were collected in only 25 instances, while a further 22 specimens were suitable only for one or other estimation—that is, 35% were absolutely satisfactory.

In those cases in which the cord-blood samples were not ideal we have been guided by whichever result was available. In practice this has usually been the cord bilirubin level, and we have treated any infant with a value greater than 2.7 mg. per 100 ml.

It is the practice in this region to collect clotted cord blood from the babies of all Rh-negative mothers, even when antibodies have not been detected antenatally. Thus, in 1953, 21 of the 49 cases not predicted antenatally were discovered on the routine Coombs-testing of cord blood, and, moreover, in each case the specimen was suitable for bilirubin estimation.

If cord-blood values were not available we have relied on clinical criteria.

Results

The 1952 and 1953 figures for live births and stillbirths are given in Table III. In Table IV the 1952 and 1953 figures for treatment and survival are combined because the results in each year were almost identical. All deaths are included, whether directly attributable to haemolytic disease of the newborn or not. The mortality in cases not receiving special care is between 16 and 20%, which corresponds closely with that in a comparable local series during 1947–9 (Walker, 1950), a time when exchange transfusion was being performed only in isolated cases.

TABLE III.—*Northumberland and Durham: Results in* 1952 *and* 1953

Place of Birth	1952		1953	
	Live Births	Stillborn	Live Births	Stillborn
Newcastle group of hospitals ..	109	11	108	16
Eleven other hospitals (not affording special facilities)	15	8	23	0
Born at home	15	2	37	0
Total	139	21	168	16
	160		184	

TABLE IV.—*Treatment and Survival in Relation to Place of Birth (Northumberland and Durham,* 1952 *and* 1953)

Place of Birth	Total Live Births	Total Deaths	Not Treated		Treated with			
					Exchange Transfusion		Simple Transfusion	
			Survived	Died	Survived	Died	Survived	Died
Newcastle hospitals ..	217	7	87	1†	118	6	5	0
Other hospitals* ..	38	6	14	5	4	1	14	0
Home ..	52	11	20	4‡	5	3	16	4

* Not affording special facilities. † This baby (Case 7), mildly affected, died from pneumonia. ‡ One infant, surviving but with undoubted kernicterus, is shown as having died.

Seven deaths occurred in 217 infants born in the special hospitals and 6 in 38 infants born in other hospitals. The difference is startling. It is even more impressive when one considers that only four of the seven deaths in the Newcastle hospitals, but 16 out of 17 deaths in the "outside" cases, were the direct result of haemolytic disease of the newborn.

The three deaths in the Newcastle hospitals not attributed to haemolytic disease were from pneumonia in a baby mildly affected (Case 7) and from cerebral birth injury in a 3-lb. (1.4-kg.) (Case 6) premature infant. (See Case Notes.) Cerebral birth injury also accounted for the one "outside" death not attributed to haemolytic disease. Two further infants (Cases 2 and 3) died after treatment in the Newcastle hospitals and were regarded as not viable because at post-mortem examination they were found to fall into the pathological classification of hydrops foetalis.

Therefore in each year, of more than 100 affected infants born in the Newcastle hospitals, only one viable baby died from haemolytic disease. There can be no doubt that the low mortality is mainly due to the preferential use of early exchange transfusion. It is of interest that of 13 infants born "outside" and treated in this way three died from haemolytic disease of the newborn. We consider that two of these infants would have survived had they been born in hospital.

We observe that only five hospital cases came to "primary simple transfusion." All just failed to meet our criteria for exchange transfusion and all survived. None needed treatment within the first three weeks of life.

Most reassuring is the fact that we were able to predict mild disease not requiring treatment in the expected 40% of live-born infants. None of these infants died from haemolytic disease, nor have any of them developed sequelae that could be attributed to it. Similarly, 38% of infants born in other hospitals or at home survived without treatment.

Severity of Disease

We must consider whether the low mortality of 1952–3 could be accounted for by the occurrence in these years of an abnormally large proportion of mildly affected infants. In attempting to assess this, two points of comparison have been taken: (1) the cord Hb, which Mollison and Cutbush (1949) showed to be the best single criterion of severity; and (2) the birth weight, because babies of 5½ lb. (2.5 kg.) or less are exposed to a greater risk of developing kernicterus than are mature infants.

TABLE V.—*Cord Haemoglobin Distribution*

	All Cases Jan, 1949–Dec., 1953		1952		1953	
Less than 13·3 g. %	33·5	49%	30	48%	29	44%
13·4–14·8 g. %	15·5		18		15	
14·9–17·7 g. %	43	51%	46	52%	48	56%
More than 17·7 g. %	8		6		8	

For practical purposes the distribution of cord Hb values in the cases under consideration follows the same pattern as that for our total series (Table V). Therefore, in this respect, there has been no unconscious bias in favour of the 1952–3 results.

Again the findings shown in Table VI do not suggest that in these years we have seen a high proportion of infants exposed to little risk. However, we feel that they do give too optimistic a view of the chance of survival of premature

babies with this disease, for in our total experience the mortality rate in premature infants treated by exchange transfusion has been about 30%.

TABLE VI.—*Treatment and Survival in Premature Infants, 1952–3*

Live Births	Died	Not Treated		Exchange Transfusion		Simple Transfusion	
		Survived	Died	Survived	Died	Survived	Died
17	3	5	Nil	8	2*	1	1†

* One infant (Case 6) has already been referred to as having died from cerebral birth injury. The other (Case 5) died on the fourth day, and at necropsy death was attributed to pulmonary collapse. Neither pulmonary haemorrhage nor kernicterus was present in either case.
† Born at home.

Case Notes of Newcastle Hospital Deaths

1952.—*Case 1:* A third affected infant in the family. Cord Hb of 95% (14.4 g.). Died two hours after completion of exchange transfusion. No cause was found even at necropsy. *Case 2:* A premature baby born *in extremis* with a cord Hb of 30% (4.6 g.). Exchange transfusion was started within 30 minutes of birth, but he died during transfusion. The post-mortem findings suggested hydrops foetalis. *Case 3:* One of twins, the other being stillborn with frank hydrops. The previous pregnancy had resulted in hydrops foetalis. This infant had a cord Hb of 30% (4.6 g.). Exchange transfusion was started within 30 minutes of birth, but death occurred during transfusion. The post-mortem findings suggested hydrops foetalis.

1953.—*Case 4:* A third affected infant, born with a Hb of 38% (5.6 g.); treated by exchange transfusion, but died on the second day. At necropsy there was generalized bleeding and marked liver necrosis, but no kernicterus. The infant had received vitamin K, but we wonder whether the liver necrosis might have prevented its synthesis and that therefore the bleeding was the result of hypoprothrombinaemia. Unfortunately, we did not estimate the prothrombin in this case. *Case 5:* The third affected infant in the family. Birth weight 4 lb. 12 oz. (2,150 g.); treated by exchange transfusion. This infant developed mild jaundice, the bilirubin being 3.6 mg. per 100 ml. at the time of death. At necropsy death was attributed to pulmonary collapse and cerebral birth injury. *Case 6:* A 3-lb. (1.4-kg.) premature baby who died shortly after exchange transfusion, never having established normal respiration. At necropsy the clinical diagnosis of cerebral birth injury was confirmed. *Case 7:* A baby with mild haemolytic disease who died from pneumonia.

Sunderland

Only the cases delivered in hospital are considered here, as the "outside" cases from this area are included in the Northumberland and Durham group. There was a big increase in the number of cases treated by exchange transfusion in the second year (Table VII). No infant who left without exchange transfusion died, apart from the case of spina bifida. The percentage of infants requiring no treatment is surprisingly small.

TABLE VII.—*Treatment and Survival, Sunderland, 1952 and 1953*

Year	Total Live Births	Total Deaths	Not Treated		Treated with			
					Exchange Transfusion		Simple Transfusion	
			Survived	Died	Survived	Died	Survived	Died
1952	12	1	4	0	2	0	5	1
1953	15	2	1	1	10	1	2	0
1952–3	27	3 (11%)	5	1	12	1	7	1

None of the infants weighed 5½ lb. (2·5 kg.) or less. The infant dying untreated in 1953 had mild haemolytic disease, but spina bifida was the cause of death.

North Riding of Yorkshire

Table VIII includes five 1953 cases delivered in this area, although resident in County Durham. It does not include, for each year, four North Riding women who were delivered in Newcastle. Four North Riding women were delivered at home even though two of them were known to be immunized. All four infants survived, although three required simple transfusion.

TABLE VIII.—*Treatment and Survival in Hospital Cases: North Riding, 1952 and 1953*

Year	Total Live Births	Total Deaths	Not Treated		Treated with			
					Exchange Transfusion		Simple Transfusion	
			Survived	Died	Survived	Died	Survived	Died
1952	6	2	0	1*	1	1	3	0
1953	24	3	7	0	8	3	6	0
1952–3	30	5 (16%)	7	1	9	4	9	0

* A premature baby with a cord Hb value of 17% died at one hour. It was not treated, being regarded as non-viable.

During 1953 there was a great increase in the number of cases predicted and therefore delivered in hospital, and a greater use of exchange transfusion. Similarly, the number of cases so mildly affected as to require no treatment has increased, and in 1953 comprised 29% of all cases. Almost equal use is being made of simple and exchange transfusion as a form of treatment, but no deaths occurred in the cases left without exchange transfusion.

Cumberland

In 1952 nine cases were predicted antenatally, and in eight of these the children were born in the special centre, while the other was delivered in another hospital. The latter was left untreated and developed kernicterus. Two cases were not predicted before birth: these infants were born at home and both died, one being too ill for treatment at the time of admission; the other received a simple transfusion, but died despite it.

In 1953 the disease was not predicted antenatally in four out of 14 live-born affected infants. One was delivered in the hospital, was diagnosed on cord-blood findings, and is included in Table IX. The other three were born at home; one died with kernicterus on the third day without having become anaemic; one was transfused during the first week and survived; the other, although severely anaemic at three months, survived without transfusion. There was only one premature infant in the two years; it was treated by exchange transfusion and survived.

TABLE IX.—*Treatment and Survival in Hospital Cases; Cumberland, 1952 and 1953*

Year	Total Live Births	Total Deaths	Not Treated		Treated with			
					Exchange Transfusion		Simple Transfusion	
			Survived	Died	Survived	Died	Survived	Died
1952	8	1	2	0	2*	1	3	0
1953	11	2	5	1	3	1	1	0
1952–3	19	3 (15%)	7	1	5	2	4	0

* One of these infants unfortunately died at 25 days from pneumonia, but is counted as a survivor in this table.

Discussion

In the five years following the end of the war the national mortality rate attributable to haemolytic disease of the newborn remained remarkably constant at 0.75 per 1,000 related live births, despite laboratory facilities for the prediction of this disease. In 1952, however, there was a significant fall, and it is tempting to attribute this to the greater use that was being made of exchange transfusion.

Even so, in 1952 435 babies were certified as having died from this disease. As there were 690,000 births in that year, one can calculate that there would be 3,100 live-born cases of haemolytic disease of the newborn; therefore the mortality rate in these infants was 14%.

We claim that the mortality rate can be reduced to 2% of live-born infants in a centre offering specialized care. Therefore, in an average year, of 700,000 births, instead of there being 440 deaths, there should be only 63.

The provision of laboratory facilities for the prediction and diagnosis of this disease is justified only if the tests involved* can be translated into terms of lives saved. This saving of life is likely to be achieved only if all immunized Rh-negative women are delivered in hospitals affording special facilities. There is no way of predicting the severity of the disease before birth : in particular, in a first affected infant it may be very severe.

In 1953 two infants admitted from "outside" died during exchange transfusion, and already in 1954 one baby, born at home and severely affected, died in the ambulance while being brought to hospital. We believe that these infants would have survived had they been born in the special centre. Similarly, a number of babies were in poor condition on admission owing to the journey from home to hospital. Most people would agree that, rather than have such a journey, ill infants would benefit from a period of rest, warmth, and oxygen between birth and the time of transfusion.

Except in very exceptional circumstances, a "flying squad" available to go out and perform exchange transfusion is not the answer, for the transfusion forms only a part of the management of these infants. We contend that delivery in special hospitals should be readily available to all immunized Rh-negative mothers.

It is well to consider whether there is some minimal number of cases a year below which it is not worth while to try to provide special facilities. As a rough estimate we would say that a "centre" requires at least one exchange transfusion a month in order to keep in practice. Therefore no centre should deal with fewer than 24 cases a year—that is, a parish of 300,000 population, representing 5,000 births a year.

It requires experience to perform safe and adequate exchange transfusion, for in less-practised hands technical difficulties are common and often the intended amount of exchange is not achieved. Moreover, a smooth transfusion produces less injury to the infant, and, if one is preoccupied with keeping the transfusion going, observation of the infant tends to be less complete.

TABLE X.—*Effectiveness of Exchange Transfusion in Different Centres*

Place of Birth	Treated by Exchange Transfusion	Deaths in Viable Infants due to Haemolytic Disease	Further Simple Transfusion Required
Newcastle hospitals ..	121	2	11
Other centres (combined)	33	7	13

Recommendations

1. Steps should be taken to try to achieve 100% prediction by antenatal blood-grouping tests.

2. Antibody-testing should be the responsibility of a limited number of laboratories, for only in this way can reliable results be obtained. Not only is considerable experience needed, but also a large panel of people with rare genotypes. This is necessary if the specificity of the antibody is to be determined—a piece of information that may be vital when it comes to selecting blood for the affected baby. The selection of blood is greatly simplified if full family serological details are available "on the spot" and if the mother's antenatal serum is available for compatibility tests. This implies that the centre undertaking antibody tests should be closely associated with the hospital of delivery.

3. As the severity of disease in the baby cannot be predicted with certainty before birth by antibody titrations or by the previous obstetrical history, all cases should be delivered in a hospital affording the following facilities : the collection and delivery of satisfactory cord-blood specimens ; a round-the-clock serological and pathological service ; supplies of appropriate blood and means for full compatibility tests and concentrating cells ; provision for the care and management of extreme ill, perhaps premature, babies ; and means of performing adequate exchange transfusion.

4. A centre should serve an area in which there is a minimum of 5,000 births a year—that is, 25 cases of haemolytic disease of the newborn yearly.

5. In each area all arrangements concerning the care of these infants should be the responsibility of one person.

6. If for some special reason a "mother with antibodies" is delivered "outside" and the home doctor is confronted with a suspected case of haemolytic disease of the newborn, two specimens of cord blood—one heparinized or in Wintrobe mixture and one clotted—should be taken, and the special centre contacted immediately. It is pointless, if not dangerous, to rush the baby to hospital before this is done.

Everyone should be alive to the clinical evidence of disease, even in cases in which antenatal serological tests have either not been carried out, or, alternatively, appear to exclude the disease. In particular, jaundice in the first 24 hours of life is virtually diagnostic.

*The minimum number of tests for any area can be conveniently arrived at by allowing for one test for each birth in the area.

Summary

The management of 451 cases of haemolytic disease of the newborn in the Northern Region in 1952–3 is described.

Evidence is presented supporting the view that the incidence of this disease is 5 per 1,000 total births, and as serological antenatal tests become more fully used so this figure is more nearly approached.

Live-born affected babies have been studied in relation to antenatal prediction, place of birth, treatment, and result. The best results were obtained when cases were delivered in hospitals offering special facilities and treated by exchange transfusion where indicated (60% of live births). The mortality under this regime can be reduced to about 2%. If this level were attained throughout England and Wales 63 instead of the present 400 or more babies would die from this cause each year.

Various recommendations for the management of haemolytic disease are made.

We are indebted to our colleagues of the medical and nursing staffs of the Princess Mary Maternity Hospital, Newcastle General Hospital, Babies' Hospital, Newcastle-upon-Tyne, and the Queen Elizabeth Hospital, Gateshead, for the care of most of these infants. The obstetricians, staffs of antenatal clinics, and family doctors have generously allowed these "mothers with antibodies" to be delivered in a limited number of hospitals. Our thanks are extended also to Drs. J. S. Faulds, J. B. Heycock, and J. J. Tillie, who supplied us with case summaries of infants in their areas ; the staffs of the Regional Blood Transfusion Service and area pathological laboratories, who performed the serological tests; Miss Kathleen Young, of the Regional Blood Transfusion Centre, who undertook much of the clerical work; and to Mr. G. Davidson, of the Child Health Department and Miss Joan Rockcliffe, of the Transfusion Service, who gave considerable technical assistance. Finally, it is a pleasure to acknowledge the help and guidance given us by the late Sir James Spence, professor of child health, and Mr. H. Harvey Evers, professor of obstetrics and gynaecology, University of Durham, and by Dr. W. G. Patterson, senior administrative medical officer, Newcastle-upon-Tyne Regional Hospital Board.

REFERENCES

Mollison, P. L., and Cutbush, Marie (1949). *British Medical Journal*, 1, 123.
—— and Walker, W. (1952). *Lancet*, 1, 429.
Walker, W. (1950). Thesis for the degree of M.D., Durham University.

INTRAMUSCULAR ERGOMETRINE AND HYALURONIDASE IN PREVENTION OF POST-PARTUM HAEMORRHAGE

USE BY MIDWIVES IN 2,002 CASES

BY

NORMAN KIMBELL, M.B., Ch.B., M.R.C.O.G.

Consultant Obstetrician and Gynaecologist, Peterborough Memorial Hospital

Intravenous ergometrine at the crowning of the foetal head, as given at University College Hospital, has been shown by Martin and Dumoulin (1953) to have a striking effect in reducing the rate of post-partum haemorrhage, and in their series of 1,000 cases the figure dropped from 13.1% to 1.2%. The intravenous route can be used by medical staff, but this enables only a small proportion of deliveries to be controlled in the conduct of the third stage of labour. In non-teaching hospitals and in domiciliary practice the great majority of deliveries are done by midwives, who are not allowed to give intravenous injections.

In order to attempt an acceleration of the absorption of ergometrine by intramuscular injection, I decided, in December, 1950, to use hyaluronidase ("hyalase") combined with ergometrine. The paediatric department of this hospital had demonstrated unequivocally that hyaluronidase had speeded up infusion therapy, and their experience so impressed me that I felt its use in obstetrics was worthy of trial.

All vaginal deliveries are carried out by the midwives in the obstetric unit unless the case becomes complicated, as, for example, a breech presentation or other indications for a house-surgeon or registrar to be called, when the intravenous route for giving ergometrine is the method adopted.

In 1950 it was the practice for the midwife to give 0.5 mg. of ergometrine, intramuscularly, as a routine on completion of the delivery, unless there was blood loss in excess before stage III of labour was completed, when the injection was given prior to the delivery of the placenta. It is thus possible to use the 1950 figures as a control, while in succeeding years (1951, 1952, 1953) the routine practice has been for ergometrine and hyaluronidase to be given at the crowning or delivery of the foetal head.

Present Investigation

The obstetric unit is split into approximately two halves, each in a separate building and each with a resident house-surgeon. It was a simple matter, therefore, to adopt different techniques while trying to discover which dosage of ergometrine was the best. One unit used 0.25 mg. of ergometrine combined with hyaluronidase (1 mg.) in the same syringe, the injection being given at the crowning or delivery of the head, while the other unit used 0.5 mg. plus hyaluronidase at the same moment of timing.

The patients were delivered in the left lateral position, the injection having already been made up by the midwife, and at the moment of crowning or delivery of the foetal head she injected intramuscularly into the thigh. The patient was turned on to her back after delivery of the baby. The midwife usually found once the baby had been attended to that there were signs of placental separation (not uncommonly the placenta was lying in the vagina), and stage III was completed by fundal pressure. If she found herself unable to give the injection at the correct time, she had to wait until stage III was completed, unless excessive haemorrhage occurred, when she was allowed to give it intramuscularly before the placenta was delivered.

Ergometrine, 0.25 mg., plus hyaluronidase was used intramuscularly in 254 deliveries, with eight cases of post-partum haemorrhage, two manual removals of placenta, and one maternal death. The death occurred, after a normal delivery, from post-partum haemorrhage and its treatment. In spite of oxytocic drugs, blood transfusion, and bimanual compression this patient continued to lose and the uterus was therefore packed. She died soon afterwards, and at necropsy the cause of death was found to be air embolism. This dosage was therefore discontinued.

As a further control, 0.5 mg. of ergometrine alone was given intramuscularly at the moment of crowning or delivery of the foetal head, and in this series there were 198 deliveries with seven cases of post-partum haemorrhage and one manual removal of the placenta. This method was also discontinued, as the rate of post-partum haemorrhage was again too high.

Finally, 0.5 mg. of ergometrine plus 1 mg. of hyaluronidase was given intramuscularly throughout the unit, and this practice has remained the routine. Up till the end of 1953, 1,748 deliveries had been done by midwives, with 17 cases of post-partum haemorrhage and 23 manual removals of the placenta. In 1953 the midwives had been able to give the injection in 92.4% out of 789 cases at the correct moment of timing. The results are shown in Table I.

TABLE I

	Control Series	At Crowning or Delivery of Head		
		0·5 mg. Ergometrine Alone	0·25 mg. Ergometrine + Hyaluronidase	0·5 mg. Ergometrine + Hyaluronidase
No. of deliveries	747	198	254	1,748
Post-partum haemorrhage	48 (6·4%)	7 (3·5%)	8 (3·1%)	17 (0·9%)
Manual removal	12 (1·6%)	1 (0·5%)	2 (0·7%)	23 (1·1%)

Post-partum Haemorrhage.—The haemorrhage rate includes all losses of 20 oz. (568 ml.) or more. Only normal vaginal deliveries done by midwives are reviewed. Pethidine is given almost invariably to women in labour, and its administration has not been a factor in the haemorrhage rate. Delayed haemorrhage some hours after delivery has not been a feature of the treated cases.

Manual Removal.—This has neither been more frequent nor more difficult in the treated series.

The injection has not produced any ill-effects. It has been noticed that when the injection is given too late—that is, when the uterus does not contain the foetal body—placental retention may develop.

TABLE II

Amount of Blood Loss	% in Control Series	% in 0·5 mg. Ergometrine + Hyaluronidase	% in 0·25 mg. Ergometrine + Hyaluronidase
0–9 oz. (0–256 ml.)	60	85·4	89·9
10–19 oz. (284–540 ml.) ..	33·6	13·7	9·4
20 oz. (568 ml.)+	6·4	0·9	0·7

TABLE III

Length of Third Stage	% in Control Group	% in 0·5 mg. Ergometrine + Hyaluronidase Group
0– 4 minutes	0·6	4·2
5– 9 "	21·6	46·8
10–19 "	66·4	46·1
20–29 "	6·1	1·3
30–39 "	3·5	0·3
40+	4·8	1·3

A comparison of the blood loss in the various groups is seen in Table II. Martin and Dumoulin found that 89.2% of their intravenous ergometrine series had losses of from 0 to 9 oz. (256 ml.). With the use of 0.5 mg. of ergometrine plus hyaluronidase intramuscularly in 1,748 cases, 85.4% had losses of from 0 to 9 oz. (256 ml.).

Length of Third Stage of Labour.—Use of intramuscular ergometrine and hyaluronidase shortens the length of the third stage as shown in Table III. In the control series 22.2% were delivered of the placenta in less than 10 minutes, while in the ergometrine and hyaluronidase series 51% completed stage III in less than 10 minutes.

Discussion

Timing is most important. Placental expression should be carried out as soon as possible. The midwife—frequently acting alone in the delivery—is unable to express the placenta quickly because she has the baby to look after immediately it is born. Nevertheless, stage III is still shorter than before intramuscular ergometrine and hyaluronidase came into use at the moment of crowning or delivery of the foetal head.

The death rate from delivery complicated by retained placenta and other post-partum haemorrhage has been supplied by the Registrar-General (Table IV), based on the 1948 International List.

TABLE IV

	No. of Deaths	Rate per 1,000 Live Births
1949	90	0·12
1950	38	0·05
1951	54	0·08
1952	39	0·06

Any technique, therefore, which will help in reducing the incidence of post-partum haemorrhage rate must inevitably reduce the risk of maternal death.

The experience of Martin and Dumoulin, confirmed by Vartan (1953), has been reaffirmed by Professor Wright, of the University of Otago, New Zealand (personal communication), who halved his post-partum haemorrhage rate in one year and did not increase his manual removal rate. Wright gives intravenous ergometrine with the delivery of the anterior shoulder.

Summary

Intramuscular ergometrine, 0.5 mg., plus hyaluronidase was given in 1,748 cases by midwives, acting alone at the delivery, as soon as the foetal head was crowned or delivered. In addition 0.25 mg., plus hyaluronidase, was given at the same point of timing in a further 254 cases, making 2,002 cases in all.

The results are compared with 747 control cases. The use of ergometrine by midwives in this way has shown that (1) the post-partum haemorrhage rate is reduced from 6.4% to 0.9%; (2) the manual removal rate is not appreciably influenced—1.6% for control cases and 1.1% for the ergometrine and hyaluronidase series; (3) blood loss is lessened; and (4) stage III is shortened.

A plea is made for the adoption by midwives of the technique outlined.

The hyaluronidase used was "hyalase" in ampoules as a sterile freeze-dried powder of 1,000 Benger units.

My thanks are due to the matron, Miss O. M. Hutson, and her sisters and staff midwives, who were entirely responsible for all the deliveries reviewed.

REFERENCES

Martin, J. D., and Dumoulin, J. G. (1953). *British Medical Journal*, 1, 643.
Vartan, K. (1953). Ibid., 1, 1108.

DISSECTING ANEURYSM OF THE AORTA

BY

W. M. JORDAN, B.M., B.Ch.
Lately, House-Physician, Poplar Hospital

King George II one day "was found fallen on the ground, speechless and motionless." He had died of a dissecting aneurysm of the aorta, and his post-mortem examination provides us with the first description of this condition (Nicholls, 1761). Shennan (1934) reviewed all the published cases in a comprehensive monograph, and analysed 300 proved at necropsy: of these, only six were diagnosed during life. As dissecting aneurysms are still but rarely diagnosed clinically, the following contrasting cases are of interest.

Case 1

A dock labourer aged 36, strong and active, was suddenly seized by an excruciating tearing pain while walking down the companion ladder of a ship. The pain was mainly in the back of the chest, and traversed through to the front, and thence up the neck into the head. He collapsed at the foot of the ladder and could scarcely breathe. He was carried into hospital, where he found that the pain was aggravated by lying flat and partially relieved by sitting up.

Examination showed a very pale and collapsed man, with a cold and clammy skin. His pulse was regular, rate 50 a minute, and the radial pulses were of equal volume. The blood pressure was 95/75 in both arms. The heart sounds were heard faintly in all areas, with no added sounds or murmurs. There were no other abnormal physical signs.

The patient continued to suffer very severe pain, which was now primarily retrosternal, and radiated into his back and down into the epigastrium and abdomen. He remained pale and collapsed, but was talkative and seemed to improve with rest in bed. Four hours later he had a regular pulse of 36. The radial pulses were distinctly unequal, the right being smaller in volume and more anacrotic. The blood pressure in the right arm was 120/60; in the left arm it was 135/70. The temporal, carotid, and femoral pulses were all equal. The cardiac impulse became more forcible and the heart sounds quite loud and clear. There was no increased area of cardiac dullness to percussion or tracheal tug. There was some epigastric tenderness but no rigidity.

The urine contained a moderate amount of albumin but no blood. Radiography of the chest showed normal lung fields. The postero-anterior view showed widening of the supracardiac shadow and some widening of the arch of the aorta. The left lateral view showed obvious dilatation of the descending arch of the aorta. The electrocardiogram (E.C.G.) showed a slow regular sinus rhythm, with normal conduction time. There was a deep Q wave in the chest lead CR_7, and notching of the QRS complex in lead CR_4. The T wave was inverted in CR_1, but full and erect in all other limb and chest leads. There was no Pardee sign.

Twelve hours later the patient again collapsed suddenly, and neither radial pulse was palpable. The apical rate was 148 a minute. A fresh E.C.G. showed sinus tachycardia, with no evidence of cardiac infarction. The patient improved slightly after the subcutaneous injection of morphine ¼ gr. (15 mg.), but later collapsed again, and died.

At post-mortem examination (Dr. D. Teare) the body was well nourished, with a long recent dissecting aneurysm of the thoracic aorta. There was a horizontal break in the intima, about 1 in. (2.5 cm.) long and 1 in. (2.5 cm.) above the aortic cusps. The dissection had travelled distally as far as the bifurcation of the abdominal aorta, and had ruptured proximally into the pericardium, which contained about 16 oz. (455 ml.) of blood. There was partial occlusion by the dissection of the root of the superior mesenteric artery, with recent infarction of the small intes-

tine and copious blood-stained mucus in the bowel, stomach, and oesophagus. There was no evidence of syphilis or of atheroma. The dissecting aneurysm was due to idiopathic cystic medial necrosis of the aorta.

Case 2

A blacksmith aged 58, tough and burly, and weighing 15 st. (95 kg.), had worked his usual 10-hour day, and was sitting quietly in the bus on his way home when he "blacked out." He had no headache, no premonitory aura, and no pain at all. He awoke in the ambulance, feeling very faint, and discovered that he had been incontinent of much faeces but not incontinent of urine.

On examination he was rational and conversational and in no discomfort. He walked in from the ambulance. His skin was moist and cold. He was very pale, with a sluggish peripheral circulation and hypostatic engorgement of his limbs. The pulses were all impalpable. The apex beat could not be felt, and the heart sounds were very faint. There were no other abnormal physical signs.

The urine contained a large volume of albumin, and the stools contained blood-stained mucus. The E.C.G. showed a rather slow but regular sinus rhythm, with no impaired conduction. There was pronounced depression of the ST segment in leads I and CR_7, and also to a less extent in leads II and CR_4. The E.C.G. was indicative of marked left ventricular preponderance, and there was no evidence of cardiac infarction.

The patient remained in this condition of extreme shock and was kept on absolute bed rest and given subcutaneous injections of morphine, ¼ gr. (15 mg.) every four hours when awake. After 36 hours he recovered partially, and his circulation improved considerably. All his pulses became easily palpable and equal. His blood pressure in both arms was 130/95. His heart sounds became loud in all areas of the praecordium, with a rough systolic murmur, maximal at the aortic area and transmitted down into the apex and up into the neck. There were no additional heart sounds and no diastolic murmurs. He remained completely free from pain at all times. He was dyspnoeic while lying down, and rather distressed by the dyspnoea. He had a very poor urinary output from the onset and passed only 20 oz. (570 ml.) in 72 hours. The sclera became yellow. On the fifth day he lapsed into a coma, and died after 12 hours.

Post-mortem examination (Dr. L. Steingold) showed a well-nourished, slightly jaundiced man with a recent dissecting aneurysm of the ascending aorta. There was a transverse tear in the endothelium, about 4 cm. long and 2 cm. above the aortic valve, in the right posterior wall. The blood had formed a saccular aneurysm about 6 cm. in diameter at this point, and had dissected the layers of the aorta distally for 8 cm. and proximally into the pericardium, which contained a large quantity of blood. A small tear was found in the adventitia just above the aortic valve. The aortic valve was moderately stenosed, with calcified and distorted cusps. There was no cardiac infarction. Marked systemic atherosclerosis, with calcification and ulceration of the abdominal aorta, was present. There was no evidence of syphilis. The dissecting aneurysm was probably due to atherosclerosis.

Comment

Dissecting aneurysm is a sudden, dramatic, and not uncommon condition. In San Francisco it occurred in 1 in 430 (0.23%) routine hospital necropsies, and in 1 in 89 (1.1%) coroners' necropsies (Mote and Carr, 1942). In London Dr. Donald Teare has personally performed necropsies on 451 cases of dissecting aneurysm in about 32,000 coroners' cases: this gives an incidence of 1 in 70 (1.4%) (Teare, 1953, personal communication). This surprising figure shows that it is a much more common condition than is usually believed. In spite of this high post-mortem incidence, very few cases are diagnosed during life, because of the rapidity with which they are often fatal, and because of a common lack of clinical suspicion. Indeed, it has been stated in textbooks that "the condition cannot be diagnosed with any certainty before death, and no treatment is of any avail" (Handfield-Jones, 1948). This is untrue. It can be diagnosed, and then supportive measures may be applied and exploratory laparotomy or embolectomy or equally harmful treatments may be avoided.

The most frequent misdiagnosis and the most difficult differential diagnosis is cardiac infarction. Here the different age-distribution may be helpful; for only 1.5% of cardiac infarcts are found under the age of 40 years (Glendy, Levine, and White, 1937), whereas dissecting aneurysm is comparatively common in the young and healthy, and 24% of these cases occur under the age of 40; while of those found in women of child-bearing years, one-half are associated with pregnancy (Schnitker and Bayer, 1944). Dissecting aneurysms can, however, be distinguished confidently from cardiac infarction in many instances by careful clinical examination alone, and the diagnosis, once made, may be supported by evidence from the electrocardiogram and the chest radiographs. In the postero-anterior view there is deformity of the supracardiac shadow, with widening of the aorta and sometimes an arcuate excrescence from it, or occasionally a shadow visible along the innominate artery. In the left lateral view the typical dilatation of the arch and the descending aorta is best seen (Wood, Pendergrass, and Ostrum, 1932).

The most disastrous misdiagnoses are the surgical. Thus of those cases which present with pain, about 60% develop epigastric pain of some severity during the course of the disease (Baer and Goldburgh, 1948). These may simulate an acute abdominal emergency, and be diagnosed as perforated peptic ulcer. But the location of the pain at the time of onset and the presence of cardiovascular signs should differentiate a dissecting aneurysm. Several cases have been reported recently in which embolectomy has been attempted from the common iliac, the femoral, or the brachial arteries (Fraenkel and Neil, 1950; Beresford, 1951). But here again the initial location of the pain in the chest or back, and the presence of cardiac murmurs, should distinguish it from a saddle embolus of the aortic bifurcation.

It is not commonly realized that over 50% of cases of dissecting aneurysm are completely and entirely painless throughout their course (Baer and Goldburgh, 1948). Patients present commonly with syncope, or they may be found in coma. They are all very collapsed, and have greatly lowered blood pressure. They are often grossly dyspnoeic, and may be much distressed. They may have neurological signs in the limbs, and these cases may easily be misdiagnosed as cerebral embolism unless the cardiovascular system is carefully examined.

Little definite is known about the natural history of those cases of dissecting aneurysm which survive the initial attack, largely because a correct diagnosis is so rare. These two cases are reported as typical of the two commonest clinical syndromes found—those which present with excruciating pain, and those which present with syncope and no pain.

Summary

Two cases of dissecting aneurysm of the thoracic aorta are reported, and the clinical diagnosis of this condition is discussed.

My grateful thanks are due to Dr. R. R. Bomford for permission and encouragement to publish these cases; and to Dr. Donald Teare and Dr. L. Steingold for the post-mortem reports.

REFERENCES

Baer, S., and Goldburgh, H. L. (1948). *Amer. Heart J.*, **35**, 198.
Beresford, O. D. (1951). *British Medical Journal*, **2**, 397.
Fraenkel, G. J., and Neil, J. F. (1950). *Lancet*, **1**, 801.
Glendy, R. E., Levine, S. A., and White, P. D. (1937). *J. Amer. med. Ass.*, **109**, 1775.
Handfield-Jones, R. M. (1948). *The Essentials of Modern Surgery*, 3rd ed. Livingstone, Edinburgh.
Mote, C. D., and Carr, J. L. (1942). *Amer. Heart J.*, **24**, 69.
Nicholls, F. (1761). *Phil. Trans.*, **51**, 574.
Schnitker, M. A., and Bayer, C. A. (1944). *Ann. intern. Med.*, **20**, 486.
Shennan, T. (1934). *Spec. Rep. Ser. med Res. Coun. Lond.*, No. 193.
Wood, F. C., Pendergrass, E. P., and Ostrum, H. W. (1932). *Amer. J. Roentgenol.*, **28**, 437.

NON-FATAL CASE OF CURLING'S ULCER IN A CHILD

BY

ANGELA BLUNDELL, M.B., Ch.B.

From the Plastic Surgery, Burns, and Maxillo-Facial Unit, Wythenshawe Hospital, Manchester

The following report describes a case of Curling's ulcer, presenting in a child within 72 hours of injury, persisting for six weeks with recurrent severe haemorrhage, and finally subsiding after healing of the burned areas.

Case History

A girl aged 4 was transferred to the Wythenshawe Hospital on March 23, 1953, with a history that thirteeen days previously her nightdress had caught alight as she attempted to rescue her doll from the fire. She sustained 25% body surface burns—16% were deep and 9% involved superficial and partial-thickness skin loss. She was admitted to the Royal Albert Edward Infirmary, Wigan, one and a quarter hours later and treated for shock with a transfusion of 1½ pints (850 ml.) of dextran, followed by 1 pint (570 ml.) of blood and 1 pint of N/5 saline over the next 24 hours. In addition, 2 pints (1,140 ml.) of fluid was given orally, making a total fluid intake of 5½ pints (3.1 litres) in the first day. Urine output appeared satisfactory, and on recovery from shock the burns were treated by exposure. A course of systemic penicillin was begun on admission and streptomycin was started two days later.

On the third day the child collapsed, but responded with further intravenous fluid. The following day melaena stools were noticed and Curling's ulcer was diagnosed. The melaena continued in a mild form over the next few days. On the ninth day a frank haematemesis followed by melaena occurred, but with a further blood transfusion the child again recovered from shock. The melaena, however, continued, and by the eleventh day her haemoglobin had fallen to 54%. After a further pint (570 ml.) of blood this rose to 84%, and in the absence of further severe haemorrhage her transfer to Wythenshawe Hospital was arranged, for subsequent grafting of the burns.

The child arrived at Wythenshawe Hospital on March 23, pale and anxious, and her haemoglobin was found to be 42%, indicating that further haemorrhage had just recently occurred. One pint (570 ml.) of blood was given over the next six hours with considerable improvement in her condition. Penicillin and vitamin K were continued intramuscularly and milk drinks were given hourly. "Nepenthe," 4 minims (0.24 ml.), and alternately phenobarbitone, ½ gr. (32 mg.), were given six-hourly as sedatives.

Early the next morning the child cried out with abdominal pain, and after vomiting several clots of blood she passed a large melaena stool. On examination epigastric tenderness and mild distension were present, but there were no signs of perforation. She became very shocked, and a second pint of blood was begun. Some improvement followed, but the next day (March 25) further haematemesis and melaena occurred, necessitating a transfusion of another 2 pints (1,140 ml.) of blood. Mild haemorrhage again occurred on March 26.

In view of the recurrent haemorrhage and limited fluid intake by mouth a very slow saline drip with added vitamin C was kept going continuously and 2 pints of blood were always available. Penicillin was discontinued, and on March 26 a course of oxytetracycline ("terramycin") was begun for the staphylococcal and coliform infection of the burns.

On March 27, ten minutes after a small warning haematemesis, the child vomited 3 oz. (85 ml.) of fresh blood and passed a massive stool of pure dark blood clots. Blood was given immediately, but the child became profoundly shocked over the next half-hour before responding.

The prognosis in this case was extremely grave, and the possibility of the child surviving abdominal operation, in an attempt to arrest the haemorrhage, was remote. Conservative treatment was therefore pursued, and, in addition to giving the sedatives three-hourly instead of six-hourly, "coagulen Ciba" was given daily, subcutaneously and orally as a haemostatic, and "alludrox," 1 teaspoonful, four-hourly by mouth. In spite of this, haemorrhage recurred on the 30th and 31st, and after a further transfusion of 1½ pints (850 ml.) of blood her haemoglobin rose to 63%.

Treatment of the Burns.—With the maintenance of the child's general condition by blood transfusions, the superficial and partial-thickness burns healed and the full-thickness sloughs separated. It was then decided that an endeavour should be made to graft the remaining deep burns as soon as possible, in the hope that decreased toxaemia would promote healing of the Curling ulcer. Curling's operation was accordingly performed on April 2 (22 days after injury), when autografts were applied to the legs and right forearm and a blood transfusion was given. The child's condition improved, but three days later, after an attack of epigastric pain, she again vomited 5 oz. (140 ml.) of blood and passed a further melaena stool, but was not unduly shocked. The next day, however, her haemoglobin was found to be only 51%, so a further pint (570 ml.) of blood was given. The first dressing showed a complete "take" of the grafts, and on April 8 the remaining burns of the right upper arm were grafted. Intermittent tarry stools were passed after a haemorrhage on the 10th, and, following a haemoglobin estimation of 55% on April 21, a final transfusion of blood was given. The burned areas had by now completely healed (six weeks after injury) and daily baths and walking exercises were started. Apart from a small melaena stool passed on April 30, the ulcer symptoms subsided and light diet was begun. Rapid improvement in the child's general condition followed.

Investigations.—The bleeding and clotting times and platelet count were normal. Barium-meal examination, postponed until June 4 through the child developing a streptococcal tonsillitis followed by chicken-pox, showed "a deformity of the duodenal cap with some spasm of the pre-pyloric antrum consistent with ulceration." Repeated investigations for occult blood in the stools until her discharge to convalescence on June 22 proved negative. Barium-meal examination repeated three months later showed persistence of the deformity of the duodenal cap. Symptoms remained absent and repeated investigations for occult blood in the stools proved negative, indicating that the ulcer remained healed.

Discussion

The clinical diagnosis of Curling's ulcer in the above case was based on the fact that recurrent haemorrhage occurred from the upper intestinal tract, in association with burns and in the absence of any abnormalities of the blood. Severe haemorrhage, manifested mainly by melaena and often preceded by severe pain, with absence of perforation, suggested that the site of the ulceration was in the posterior duodenal wall.

Curling's ulcer is usually recognized as a late complication of burns, becoming manifest during the second week, when infection and toxic absorption from the separating sloughs is predominant. In this case the melaena first observed on the fourth day probably resulted from haemorrhage occurring when the child collapsed on the third day. This early onset of symptoms suggested that the acute ulceration occurred during the stage of shock. Oligaemic shock and the accompanying rise in blood urea may have caused some devitalization of the intestinal mucosa, following which, acid secretion, increased in burns by histamine liberation, caused ulceration. Ulcer symptoms became worse as infection increased, and were not controlled by the usual conservative measures. As soon as the burns had healed and infection was controlled the symptoms of the ulcer subsided.

The persistence of the duodenal cap deformity three months later, in the absence of further signs and symptoms, indicated that the ulcer had healed, leaving a considerable degree of scarring. This scarring, together with its interference with the normal growth of the duodenum, may lead to the development of pyloric stenosis in the future.

Summary and Conclusions

A case of Curling's ulcer in a child aged 4 years with 25% body surface burns is described. From the third day onwards for six weeks, severe attacks of melaena and haematemesis occurred, during which time a total of 13½ pints (7.7 litres) of blood was given. After two grafting operations, with resultant healing of the burns, the ulcer symptoms subsided and the child improved rapidly.

The prognosis in cases of Curling's ulcer is poor, especially in children, death occurring most often from haemorrhage or perforation. This case illustrates that if conservative treatment of the ulcer and its complications can be maintained until the burns have healed, then the ulcer will heal spontaneously.

My thanks are due to Mr. Randell Champion for his encouragement in publishing this case.

OBSERVATIONS ON THE TREATMENT OF RHEUMATOID ARTHRITIS BY TRANSFUSIONS OF BLOOD FROM PREGNANT WOMEN*

BY

CYRIL JOSEPHS, M.D., D.C.H.

Late Medical Registrar, Staincliffe General Hospital, Dewsbury, Yorkshire

It has often been found that blood transfusion is effective in initiating a remission or recovery from rheumatoid arthritis. There have been many suggested explanations for the improvement. The anaemia which is so often present in rheumatoid arthritis is in most cases peculiarly resistant to treatment by oral administration of iron. Transfusion will improve this, even if only temporarily. Hartung (1943) suggested that improvement may be due to a form of non-specific protein-shock reaction or possibly to transmitted passive resistance.

Many physicians have repeatedly confirmed the potentially favourable effect of pregnancy on the course of rheumatoid arthritis. Sclater (1943), in an analysis of 388 cases of rheumatoid arthritis, noted that in no case did arthritis manifest itself during pregnancy. Hench (1938) had already stressed this point. In his observations on 22 women with rheumatoid arthritis during 37 pregnancies Hench showed that 20 of the 22 patients experienced striking and generally complete relief of symptoms during pregnancy and for a period afterwards varying from 1 to 24 months.

The frequently favourable effect which pregnancy has on the course of rheumatoid arthritis has encouraged many workers to look for an explanation of this phenomenon in the hope that therapeutic advances would be forthcoming. Barsi (1947) thought it might be possible to imitate the effect of pregnancy on arthritis by transfusion with blood from pregnant women. He assumed that the improvement was due to a hypothetical substance circulating in the blood of pregnant women which could be transfused and utilized elsewhere. On the basis of these conjectures he transfused the blood of pregnant women into persons suffering from rheumatoid arthritis. In each case he gave 300 ml. of citrated blood, and repeated this several times according to the symptoms of improvement. He recorded the results in six cases selected from "those seemingly hopeless cases in which scientific treatment had so far yielded no results." He claimed that when improvement occurred it took place rapidly, with dramatic suddenness compared with the months or years needed to effect an improvement with gold therapy. Two cases were said to have shown lasting improvement and did not relapse—and cure was permanent in four cases. The period of follow-up was from two to six months. More recently Barsi (quoted by Hench, 1949) has reported the effect of repeated blood transfusions with blood from pregnant women in 28 cases of "seemingly hopeless" rheumatoid arthritis. Sixty-four per cent. recovered or improved, while in 6 cases a complete remission was said to have resulted and 4 were cured for three to five years of follow-up study.

I decided to investigate the results of treatment on lines similar to those advocated by Barsi and to compare these results with those obtained by transfusions of ordinary blood. I did not wish to select my cases in any way, and no restrictions were enforced from the point of view of age or sex of the patient, or severity of the disease.

Method

Fifty-three cases of rheumatoid arthritis, chosen at random, were given repeated intravenous transfusions of 300 ml. of blood from pregnant women of the corresponding blood groups. Transfusions were given so far as possible at weekly intervals. In some cases in which improvement occurred it was not considered necessary to give transfusions at so frequent intervals, and in a few cases the interval between transfusions was delayed owing to unavoidable circumstances.

Forty-five unselected cases of rheumatoid arthritis were treated by the same technique, using blood from non-pregnant donors of both sexes. All cases were observed for a minimum of six months and a maximum of eighteen months.

Pregnant women who volunteered to donate their blood were drawn from two sources. In the main, they were normal healthy women who were attending an antenatal clinic. They were at various stages of pregnancy, though it was not thought advisable to withdraw blood from those who were expecting their babies in the very near future. The donors were collected at random, the only restricting factor being that they had to be considered fit enough to withstand the withdrawal of blood without this having any harmful effect on the donor.

A few of the donors were selected from pregnant women who were hospital in-patients. Again the health of the donor had to be considered, and patients were chosen who would themselves be likely to benefit by the blood donation. (These included such cases as toxaemia of pregnancy (including pre-eclampsia), nephritis, and hypertension.)

With all donors, a blood count was done, the Wassermann and Kahn reactions were checked, and the blood groups (ABO and rhesus) were determined. A record was kept of the parity of the donor, the stage and any abnormality of the immediate pregnancy, and the blood pressure at the time the blood was taken.

*This paper is based on a thesis presented for a degree of M.D. at the University of Durham in June, 1950.

I personally withdrew the blood from each donor. In each case 300 ml. was taken from a vein in the antecubital fossa by direct introduction of a transfusion needle.

It was intended that the blood should be collected and stored in a similar way to that practised by those who collected non-pregnant blood. Accordingly, the blood was collected under sterile conditions into bottles containing 2 g. of disodium citrate, 3 g. of dextrose, and 120 ml. of sterile distilled water. The blood so collected was stored in a refrigerator which was thermostatically controlled (maintaining a temperature beween 2 and 4° C.) and in which the ordinary (non-pregnant) blood was normally stored. Any bottle of blood which was suspected of bacterial contamination or haemolysis was discarded.

No blood which had been stored for more than three weeks was used, and the time between the donation and the transfusion was noted.

By observing the above routine, I felt I would be able to make a fair comparison between the results obtained by transfusion with pregnant and with non-pregnant blood.

Assessment of Cases

The assessment for improvement in rheumatoid arthritis is necessarily more difficult than it is in the more acute diseases. Bayles and Hall (1943) devised the following criteria for evaluating treatment in rheumatoid arthritis: functional activity, activity of disease, degree of deformity, sedimentation rate, haemoglobin value, and body weight.

It was thought advisable to grade the cases of rheumatoid arthritis by the system suggested by Sclater (1943), who divided his cases into four groups according to their objective features: (1) patients with periarticular swelling and stiffness, but only slight limitation of movement; (2) those with swelling and greater limitation of movement but no ankylosis—they were capable of work; (3) those with fixed joints and flexion deformities—they were unable to work; and (4) those with gross deformity—they were either bedridden or severely crippled.

Blood and urine investigations were carried out in each case before transfusion. Red and white cell counts, haemoglobin (using the Haldane estimation), grouping (ABO and rhesus), and Wassermann and Kahn reactions, erythrocyte sedimentation rate (using the Westergren method), sugar content (Folin and Wu), and blood urea by Archer and Robb's urease nesslerization technique constituted the examination of the blood. The urine was examined microscopically and tested for albumin and sugar.

On each subsequent visit by the patients the above investigations were repeated, except for the Wassermann and Kahn reactions and the blood groups.

It was felt that whilst the "group" classification of Sclater was most useful and the laboratory investigations gave valuable information, due regard should be given to subjective improvement experienced by the patient.

Thus, in finally assessing the results of treatment, I considered the cases from three points of view—namely, the subjective aspect, the objective aspect, and the results of laboratory investigation.

Details of Results

	Transfusions of Blood from	
	Pregnant Donors	Non-pregnant Donors
No. of cases treated	53	45
Cases in Group 1	7	19
" " " 2	21	16
" " " 3	15	8
" " " 4	10	2
Proportion showing some subjective and objective improvement ..	56%	44%
Proportion showing a marked subjective and objective improvement ..	19%	13%
Proportion showing some subjective and objective improvement 1½ years after last transfusion	43%	38%

Summary and Conclusions

Intravenous transfusions of 300 ml. of blood from pregnant women of corresponding blood groups were given to 53 cases of rheumatoid arthritis at weekly intervals; the results are analysed. It is considered that transfusions of blood from pregnant women produce amelioration of symptoms and signs of rheumatoid arthritis to an extent similar to that produced by transfusions of blood from non-pregnant donors, and will not produce remission to a degree comparable to that produced by pregnancy.

A few cases seemed to illustrate the degree of dramatic improvement which had been claimed to occur with transfusions of blood from pregnant women. Yet this degree of improvement was found quite rarely in the present series of cases. Moreover, in some cases an equally dramatic improvement was observed with transfusions of blood from non-pregnant donors.

Visible signs of improvement should be the main criteria in assessing amelioration of the condition. It is felt that many who claimed to have improved, experienced only a psychological benefit. A marked anaemia present initially was usually followed by subjective improvement after transfusion, but this was not always accompanied by improvement in the arthritis.

The results of transfusion are variable, and in the main unpredictable. A mild case may not improve at all, while a more severe case may improve considerably. In one case marked improvement occurred after transfusions of blood from pregnant donors, followed by a severe relapse which did not respond to another transfusion.

Grateful thanks are due to the staff of Staincliffe General Hospital, Dewsbury, Yorks; to the late Dr. N. J. S. Nathan, medical superintendent of Staincliffe General Hospital, from whose antenatal clinics the pregnant donors were obtained; to Mr. Norman Coward, who carried out the laboratory investigations; and to Dr. T. S. Marshall, of the Leeds Regional Transfusion Service, who gave invaluable help and advice in all matters relating to the blood transfusions.

REFERENCES

Barsi, I. (1947). *British Medical Journal*, **2**, 252.
Bayles and Hall (1943). Quoted by P. S. Hench *et al.*, *Ann. intern. Med.*, 1948, **28**, 111.
Hartung, E. F. (1943). *Bull. N.Y. Acad. Med.*, **19**, 693.
Hench, P. S. (1938). *Proc. Mayo Clin.*, **13**, 161.
—— (1949). *J. Amer. med. Ass.*, **139**, 718.
Sclater, J. G. (1943). *Ann. rheum. Dis.*, **3**, 195.

Mr. R. J. McNEILL LOVE, chairman of the Medical Sickness, Annuity, and Life Assurance Society, addressing the annual meeting on June 22, said that the Society could look back on 1953 with much satisfaction. New business continued to expand, investments showed a steady appreciation, and the rate of interest had increased. New life assurance amounted to £1,618,347, which was over 40% more than in 1952. The Society was once more encouraging house-purchase business, and was normally prepared to advance up to 90% of the value of a house, with interest at 5%. In the Sickness Fund, for the second successive year, new business had produced a record in the Society's history and amounted to more than 12,000 guineas a week. The aim of this department was to protect doctors and dentists from the financial effect of an illness or accident, and each year over 1,000 members received benefit under their policies. The Medical Sickness Finance Corporation, a subsidiary company, was now able to use its own income to finance most of its advances. It provided finance for the hire-purchase of cars, medical and dental equipment, etc.

SLITTING OF URETERIC ORIFICE CYSTOSCOPICALLY FOR IMPACTED CALCULUS

BY

H. P. WINSBURY-WHITE, F.R.C.S.

Senior Surgeon, St. Peter's and St. Paul's Hospitals for Urological Diseases

This method of dealing with a stone impacted just outside the bladder wall deserves to be more widely known because it generally succeeds with stones up to a certain size. It is a simple measure and may be the means of avoiding a major operation. The intervention should be repeated if there is failure after the first one. I have employed it for many years.

It is a matter of experience that, depending on their size, most ureteric calculi pass spontaneously; nevertheless there is continued growth of the impacted stone with the march of time.

FIG. 1.—A plain *x*-ray film showing the stone in the right side of the pelvis.

The facts below relate to a man of 40 who had had several attacks of colic on the right side over a period of six months; the last one 2½ weeks before his first visit. An *x*-ray film showed a stone in the extramural portion of the right ureter (Fig. 1). It was proved by intravenous urography to be outside the bladder. I carried out cystoscopic meatotomy under a general anaesthetic without success; four months later I repeated the operation. After passing a ureteric catheter up the right ureter a cutting current was used through the meatotome, after this had also been entered into the ureteric orifice. Thus the orifice was slit from within outwards. The ureteric catheter was left in position for the subsequent 24 hours.

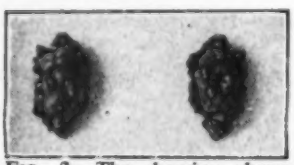

FIG. 2.—The drawing shows the actual size and appearance of the stone on two aspects and clearly illustrates the surface irregularities.

The patient was discharged from hospital four days later with the stone *in situ*, but he ultimately passed it (Fig. 2) 15 days after the operation. An interval of this kind between the operation and the passage of the stone is not unusual.

Subsequent *x*-ray films showed no evidence of harm to the kidney from the delay between the two operative procedures. Fortunately there is not the same danger to the kidney from back pressure as there is when the stone is lodged in the lumbar region.

It might well be asked how could slitting the ureteric orifice help to dislodge a stone outside the bladder wall, with the narrowest part of the ureter—the uretero-vesical junction—yet to be negotiated? It is probably because the surgical intervention encourages dilatation if not peristalsis of the ureter.

IS LIVER A "TONIC"?

A SHORT STUDY OF INJECTING PLACEBOS

BY

J. R. O'BRIEN, D.M.

Quite apart from the beneficial effect of liver and vitamin B_{12} in the megaloblastic anaemias, many doctors believe that some non-anaemic patients feel better after the administration of these substances. Recently Yudkin (1952) administered liver to healthy children. This produced an increase in weight and height which was 20–40% above that of the control group. He suggested that this result was due to a factor other than vitamin B_{12}. Contrary to some American work (Wetzel *et al.*, 1949; Chow, 1951), it has been found that in premature infants (Downing, 1950) and in underweight children (Benjamin and Pirrie, 1952) vitamin B_{12} did not increase the weight or decrease the incidence of minor ailments.

This report compares the subjective effect of giving liver and vitamin B_{12} with that of saline in four groups of patients. No blood investigations were done, but all people who had signs or symptoms even suggestive of anaemia were excluded.

Method

It was impossible to define "being run down" or the properties of a "tonic," but it was decided that a satisfactory "tonic" would cause the patient to answer some or all of the following questions in the affirmative: Do you feel better? Are you more energetic? Is your appetite better? Are you sleeping better? These four questions were listed in a questionary, each question being put the three possible ways—namely, Do you feel the same? Do you feel better? Do you feel worse? The questions were read over to the patient at the time of the injection and filled in a week later.

Equal numbers of ampoules containing either 2 ml. of "plexan" (a liver extract) or 50 μg. of vitamin B_{12}, or 2 ml. of normal saline, were prepared and so coloured that they were indistinguishable. Each ampoule was identified only by a random number, the significance of which was unknown to the observers.

There were four groups of volunteers. In Group I were young adult males with active pulmonary tuberculosis, all in one ward; in Group II were middle-aged or aged patients of either sex in a chronic ward suffering from various diseases such as paraplegia and chronic arthritis; in Group III were middle-aged orthopaedic out-patients of either sex attending a physiotherapy department, mostly for rheumatoid arthritis; and in Group IV were general practitioners' patients of either sex and varied ages who asked for a "tonic."

It seemed that the effect of these substances could be studied either by giving a large number of different injections to a few suitable subjects or by giving a single injection to a large number of subjects. In fact, it was found convenient to compromise, and a considerable number of patients each had from one to six injections. Repeated injections were nearly always given at weekly intervals. The number of patients was left to the arbitrary choice of the individual observer.

Results

A total of 227 injections were given to 86 subjects with an almost equal distribution of the three ampoules. The answers of all groups to the question "How do you feel?" are represented in the last column of Table I. Following an injection of vitamin B_{12} and "plexan" 49% and 48% respectively of the answers claimed an improvement, compared with a 43% improvement after saline. This difference

cannot be regarded as significant. The answers to the remaining questions also showed no significant difference between the three types of injections.

Since the three kinds of injections could not be distinguished, they must be assumed to have had no physical effect as a tonic. All 227 injections can therefore be regarded as placebos, irrespective of the contents of the phial.

Differences Between Groups.—In Table I the results are divided according to the group to which the subject belonged. Again saline was not appreciably inferior to liver

TABLE I.—*Answers to Question "How Do You Feel?"*

		Group I		Group II		Group III		Group IV		Total	
		%	No.	%	No.	%	No.	%	No.	%	No.
Plexan	Better	11	1	14	3	69	9	70	23	48	36
	Same	78	7	81	17	31	4	24	8	48	36
	Worse	11	1	5	1	—	—	6	2	4	4
Vitamin B_{12}	Better	17	3	23	3	64	7	73	24	49	37
	Same	83	15	77	10	27	3	24	8	48	36
	Worse	—	—	—	—	9	1	3	1	3	2
Saline	Better	16	3	16	2	64	9	61	19	43	33
	Same	79	15	84	10	29	4	29	9	50	38
	Worse	5	1	—	—	7	1	10	3	7	5
Total	Better	15	7	16	7	66	25	68	66		
	Same	81	37	82	37	29	11	26	25		
	Worse	4	2	2	1	5	2	6	6		

or vitamin B_{12}. There is, however, a marked difference between the groups; an improvement was reported many more times in Groups III and IV than in Groups I and II. This difference must be explained by the degree of suggestibility of the patient or the degree of suggestion employed by the doctor.

In Group I the doctor in charge was strictly neutral. He explained that it was a trial. The subjects—young Service personnel—were probably less suggestible than those in other groups. In Group II another doctor selected from his chronic ward patients whom he thought would be reliable witnesses, and asked them to "try to distinguish between the injections, some of which were supposed to be a tonic." Group III injections were given by a strictly neutral sister, and no mention was made of a "tonic," the patients assuming that the injections were for their rheumatism. The high degree of improvement reported may have been due to the general air of optimism in a physiotherapy department dealing with a chronic disease. The patients in Group IV had asked their doctor for a tonic, and by so doing had virtually declared themselves as mentally unwell.

Differences Between Sexes.—In Groups II and III the females reported more improvement than males, owing presumably to the greater suggestibility of women. There was no such sex difference in Group IV, consisting exclusively of the self-declared mentally unwell.

Differences Between Questions.—On the whole within each group the percentage of replies reporting better, same, or worse was about the same for each of the four questions, but there were exceptions. The percentages of answers reported after the 97 injections given by the general practitioners are shown in Table II.

TABLE II.—*Results in Group IV*

		Plexan	Vitamin B_{12}	Saline	Total
Feel	Better	23	24	19	68%
	Same	8	8	9	26%
	Worse	2	1	3	6%
Energy	Better	24	18	20	64%
	Same	8	14	8	31%
	Worse	1	1	3	5%
Sleep	Better	12	12	11	36%
	Same	18	20	15	55%
	Worse	3	1	5	9%
Appetite	Better	11	9	12	33%
	Same	22	22	17	63%
	Worse	—	2	2	4%

The great improvement in the sense of well-being and energy contrasts with the slight improvement in sleep and appetite. This presumably indicates that it is easier to persuade oneself of an improvement of a feeling which is entirely subjective than to persuade oneself of an improvement in a function that has some measure of objective assessment.

Conclusions

The patients investigated could not distinguish between injections of liver, vitamin B_{12}, and saline. The reported effect of the injections probably depends on the suggestibility of the patient and the attitude assumed by the doctor. Women appear more suggestible than men, and subjective sensations are more likely to be influenced than those capable of in part objective assessment.

Summary

A total of 227 injections of liver, vitamin B_{12}, and saline were given to four groups of non-anaemic patients.

The "tonic" effect of an injection of saline was no less than that reported after an injection of liver or vitamin B_{12}. The reason for the different trends of the answers between the groups is discussed.

My grateful thanks are due to the following for giving the injections and thereby enabling this study to be achieved: Drs. M. C. Cooper, S. M. Davidson, J. A. Ewing, H. A. W. Forbes, P. Metcalfe, A. R. Walker, F. L. Willington, and Mr. M. H. Salz. My thanks are also due to Messrs. Glaxo Ltd. for preparing and disguising the ampoules.

REFERENCES

Benjamin, B., and Pirrie, G. D. (1952). *Lancet*, **1**, 264.
Chow, B. F. (1951). *J. Nutr.*, **43**, 323.
Downing, D. F. (1950). *Science*, **112**, 181.
Wetzel, N. C., Fargo, W. C., Smith, I. H., and Helikson, J. (1949). *Science*, **110**, 651.
Yudkin, J. (1952). *British Medical Journal*, **1**, 1388.

Medical Memoranda

A Case of Carcinoma of Colon Presenting as Pyelitis

Vesico-colic fistula is a well-known but rare complication of either diverticulitis or carcinoma of the pelvic colon. Rarer causes are trauma, carcinoma of the bladder, tuberculosis or actinomycosis of the bowel, and carcinoma of the ovary.

The characteristic symptom is pneumaturia and the passage of small flakes of faeces per urethram. Before the formation of the fistula occurs, however, there may be attacks of cystitis. Infection of the upper urinary tract is rare, and in 16 of Edward's (1948) cases occurred only once. In the following case two attacks of pyelitis occurred five months before the onset of pneumaturia.

CASE REPORT

A man aged 47 was admitted to the London Hospital on August 13, 1951. Five months previously he had been admitted to another hospital with acute pyelitis. He had rigors, severe pain in the loins, suprapubic pain, severe dysuria, and increased frequency of micturition. His symptoms improved after a course of potassium citrate and "sulphatriad." Subsequent cystoscopy, intravenous pyelography, and barium follow-through showed no abnormality. Two weeks later he again developed severe pain in the loins, and this persisted. Ten days before admission he noticed passage of gas per urethram and that his urine was very dirty.

Five days before admission he was seen in the out-patient department of the London Hospital. Cystoscopy failed because the urine was so dirty. It contained pus, and *Bact. coli* grew on culture. On examination he was a sallow, ill-

looking, and very nervous man. There was some tenderness in each loin, but no other abnormal signs. On August 15 a barium enema was inconclusive, but suggested an organic obstruction in the pelvic colon. The patient would not retain enemata, and at the examination the lower bowel was loaded with faeces. Sigmoidoscopy the next day failed for the same reason, but cystoscopy showed the presence of a vesico-intestinal fistula far back on the bladder base, just to the right of the midline. Sigmoidoscopy to 15 cm. was repeated on August 21, but no abnormality was detected.

Laparotomy was performed on August 23. A loop of pelvic colon was densely adherent to the bladder, and a large hard tumour was palpable at this site. The liver, omentum, and peritoneum were studded with deposits of secondary growth, and a small piece was removed for histological section. The pelvic colon was divided above the growth, the distal end embedded, and the proximal loop brought out as a terminal colostomy.

The histological report was "secondary trabecular, polygonal-celled, rarely tubular columnar-celled carcinoma in omentum, compatible with a primary in colon."

The colostomy acted on the sixth day. Pneumaturia and dysuria persisted until the seventh day, but thereafter micturition was painless and of normal frequency. The patient was discharged on September 25 and died on December 2, 1951.

I am grateful to Professor V. W. Dix for permission to operate on this patient and to publish the case.

A. J. WALTON, F.R.C.S.
London Hospital.

REFERENCE

Edwards, H. C. (1948). *British Surgical Practice*, 3, 273. Butterworth's Medical Publications.

Torsion of the Puerperal Uterus Associated with Red Degeneration of a Fibromyoma

Torsion of the uterus is a rare complication of the puerperium, and I have been able to find only one case in the literature. Trillat, Michon, and Dargent (1932) described a patient admitted 15 days after her confinement with puerperal pyrexia. The early days of the puerperium had been normal, but her temperature was found to be raised on the eighth day and uterine involution was delayed. About four weeks after delivery a phlebitis of the left leg developed and a week later a similar phlebitis of the right leg. It was thought that she had an intrauterine infection and laparotomy was undertaken. No adhesions were present, but the uterus was enlarged to the size of a foetal head and had undergone torsion at the level of the isthmus through 90 degrees from left to right. As it was thought that a haematometra was present, it was decided to undertake subtotal hysterectomy, but after operation it was found that the enlargement of the uterus was due to a fibroid which had undergone red degeneration. The temperature fell to normal during the 24 hours after operation and the bilateral phlebitis underwent rapid and spontaneous cure.

The authors comment on the absence of pain and bleeding in association with a marked degree of red degeneration. They observe that pregnancy stimulates growth of uterine tumours and particularly predisposes to degeneration. After delivery, however, the myoma usually regresses, but it appeared that in this case the fibroid grew in size during the puerperium, and it seems probable that the red degeneration had occurred entirely after the pregnancy had been completed. It also seems likely that the enlargement of the uterus and degeneration may have been promoted by the torsion of the uterus, which interfered with the free circulation to the tumour, and this same factor had probably played a part in the causation of the double phlebitis. From the point of view of treatment, the only logical conduct according to the authors was laparotomy, but they regret not having carried out a myomectomy in this young woman. Owing to the fact that they believed that the uterus contained a haematometra, however, they would not have dared to undertake this operation even had they recognized the presence of a fibroid. Finally, they point out that phlebitis should not be a contraindication to operation if there is a pelvic lesion which may be playing a part in the causation of the phlebitis.

A somewhat similar case has recently been observed.

CASE REPORT

The patient, aged 33, had been delivered of twins at the 38th week of her fourth pregnancy. Soon after delivery she developed a marked pyrexia, her temperature swinging up to 101° F. (38.3° C.), and this had been treated with penicillin, but persisted for two and a half weeks. During this time she had some abdominal pain, and slight pain persisted when I saw her five weeks after delivery. All the pyrexia had settled down. She was pale (Hb 62%), but her general condition appeared to be fairly good. Examination of the abdomen showed a tumour the size of a 28-weeks pregnancy which was solid, slightly fluctuant, and only slightly tender. Pelvic examination confirmed that the tumour was uterine, that the os was closed, and that there was a very little mucoid discharge from the uterus. The possibility of a third foetus was considered, but the appearances of the abdomen did not confirm this, and it appeared that we were dealing with a large uterine fibroid which must have coexisted with the twin pregnancy, and had indeed, according to the patient's doctor, produced a formidably distended abdomen.

On January 22, 1952, laparotomy was undertaken and the presence of a large fibroid uterus confirmed. The uterine fundus was firmly wrapped round with omentum, but this was separated off without much difficulty, and it was evident that the uterus had undergone axial torsion through 180 degrees at the level of the isthmus. The right tube and ovary had been displaced across to the left side of the abdomen, and the left tube and ovary lay posteriorly on the right side. This torsion was undone without difficulty, and, in view of the fact that the patient already had five children, total hysterectomy was carried out, both appendages being preserved. Section of the uterus showed that the large fundal fibroid, whose diameter was 14 cm., had undergone red degeneration and that the myomatous elements were extremely necrotic, only the collagenous stroma being relatively well preserved. The uterine cavity was a little enlarged, its total length from the external os being 4½ in. (11.4 cm.). There was no evidence of malignancy. The patient made an uneventful recovery and was discharged home on February 2.

COMMENT

In this case, as in the case of Trillat, Michon, and Dargent described above, it appears probable that torsion of the puerperal uterus had been initiated by the weight of the large fundal fibroid acting on the lax musculature of a previously distended uterus, the distension in this case having been particularly marked on account of the presence of a multiple pregnancy. There had been no infection of the uterus, but the pyrexia which had been observed during the puerperium had probably been due to the red degeneration of the fibroid, resulting from interference with its blood supply consequent upon torsion. Subsequently, the condition had become less acute, probably as a result of some compensatory adjustment of the blood supply. The most remarkable feature of this case appears to have been the presence, during the pregnancy, of a fibroid of very considerable size, even if its maximum size was not reached in the puerperium until after the circulatory obstruction resulting from the torsion.

J. A. CHALMERS, M.D., F.R.C.S., F.R.C.O.G.,
Consultant Obstetrician and Gynaecologist,
South Worcestershire Hospital Management Committee.

REFERENCE

Trillat, Michon, L., and Dargent (1932). *Bull. Soc. Obstét. Gynéc. Paris*, 21, 713.

Reviews

THORACIC SURGERY

A Practice of Thoracic Surgery. By A. L. d'Abreu, O.B.E., Ch.M., F.R.C.S. (Pp. 591; illustrated. 80s.) London: Edward Arnold and Co. 1953.

Mr. A. L. d'Abreu is to be congratulated on his achievement in writing this book. Although thoracic surgery has matured only within the lifetime of many of us, it has quickly assumed a size that makes it a big and difficult task for any one surgeon to present a complete and authoritative account. As well as on the excellence of its contents, Mr. d'Abreu is to be congratulated on the energy and endurance he has displayed.

In the preface he states he deliberately selected the words "a practice" rather than "the practice of thoracic surgery." In this book he has presented his own views, experiences, and practice. The result is a readable book, well illustrated and simple but comprehensive and authoritative. The weakest part is that on cardiac surgery, but this is understandable, since rapid developments had outdistanced the written account by the time the book had been printed and published. No doubt this will be easier to keep up to date in future. There is little to criticize, but a few features need mention. Figure 3.1 is so obviously wrong that it is a plain error.

The recommendation on page 76 of resection of a complete rib for routine thoracotomy is not in keeping with the best modern practice, which seeks to conserve the chest wall as much as possible. It is especially undesirable in bronchiectasis, although (p. 171) it is recommended. The "Robert's flap" method of treatment of a chronic empyema is also largely obsolete. One regrets the use of the incorrect term "dorsal lobe" (p. 175); this was rejected by the Thoracic Society and the International Committee on bronchial nomenclature several years ago, and its perpetuation is a disservice. On page 307 we read that the venous pressure may be "30–40 c.c. of water," whatever that may mean. There is also a careless use of "*x* ray" for radiograph. The diagram of resection of a coarctation of the aorta in Figure 16.15 is too unreal to be of help to the surgeon seeking guidance. These criticisms are minor and can all be remedied in the new edition, which will surely soon be needed.

R. C. BROCK.

TUBERCULOSIS IN CHILDREN

Tuberculosis in Childhood and Adoleseence: With Special Reference to the Pulmonary Forms of the Disease. By F. J. Bentley, M.D., F.R.C.P., D.P.H., S. Grzybowski, M.D., M.R.C.P., B. Benjamin, B.Sc., F.I.A. Preface by Sir Robert A. Young, C.B.E., M.D., F.R.C.P. Foreword by Wilfrid Sheldon, C.V.O., M.D., F.R.C.P. (Pp. 259; illustrated. 30s. or $5.) London: National Association for the Prevention of Tuberculosis. 1954.

Primary tuberculosis provides a wide field for theories and speculations, and they are often diametrically opposed to one another. The disease is contracted at some time by over 90% of the inhabitants of these islands and varies greatly in its manifestations. It is not surprising, therefore, that individual clinicians may have very different experience of the disease. The authors of this book are well aware of the danger of basing views on selected material and have made every effort to allow for such a bias. They have carefully reviewed over a thousand consecutive patients discharged from, or dying in, Highwood Hospital, London, during the years 1942–6, and have followed up the survivors during the years 1949–52. In addition they have analysed the records of 100 children who died from tuberculosis in London in the years 1948–50. The analysis of both series is notable for its thoroughness, its sanity, and its lack of bias. The authors are obviously seeking the truth from the facts rather than finding facts to suit their theories. For instance, in discussing whether a pleural effusion arises by a direct spread from a primary tuberculous lesion or by way of a haematogenous dissemination they found evidence in favour of both theories, and conclude very reasonably that either may occur.

The book covers simple primary tuberculosis, segmental lesions, post-tuberculosis syndromes, pleural effusions, miliary tuberculosis, chronic pulmonary tuberculosis, and non-pulmonary manifestations of tuberculosis, and there is a brief appendix on the epidemiological aspects. It should be read by every chest physician and paediatrician. It will remain a source of reference for many years.

J. CROFTON.

STONE IN THE URINARY TRACT

Stone in the Urinary Tract. By H. P. Winsbury-White, M.B., Ch.B.Ed., F.R.C.S.Ed., F.R.C.S.Eng. Second edition. (Pp. 328; 144 figures. 63s.) London: Butterworth and Co. Ltd. 1954.

The second edition of this classical work on stone in the urinary tract has come at a most opportune time, when so much recent work which at first sight appears to be not only controversial but even contradictory has been published on almost all aspects of urinary lithiasis. The fact that this new work has been recorded, discussed, and correlated by such an acknowledged authority as the author of the book under review makes this edition an outstanding contribution to urology. The changes in the incidence of stone in regard to age, sex, and locality in recent years have made necessary a complete revision of nearly all the statistical matter appearing in the previous literature, and in doing this the author has been able to draw on his own large personal series of cases.

Recent views on the sources and structure of renal calculi and their association with calcification of the renal papillae are fully discussed. The part played by infection of the lower urinary and genital tracts in the causation of stone in the kidney as well as in the lower urinary system is clearly shown. Pathological changes are depicted by many excellent *x*-ray pictures, and by coloured and black-and-white illustrations; this obviates much tedious description. The controversial subject of bilateral renal calculi has been thoroughly reviewed in the light of recent advances in therapeutics and operative procedures. Conservative and prophylactic measures advocated for the treatment of urinary stone are discussed and assessed. The author's extensive experience in the surgical treatment of renal calculi makes this part of the book most valuable. Stone in the ureter, bladder, and prostate gland are also comprehensively dealt with. This book will be found to be an essential work of reference and information for all undertaking the treatment of stone in the urinary tract.

J. E. SEMPLE.

TESTS FOR BABIES

The Abilities of Babies: A Study in Mental Measurement. By Ruth Griffiths, M.A., Ph.D., Dip.Ed., F.B.Ps.S. (Pp. 229; illustrated. 20s.) London: University of London Press Ltd. 1954.

The title of this book is misleading, for it does not really set out to describe the abilities of babies but rather to describe a method of determining their level of development. A large battery of tests is described, mostly modified from the writings of Arnold Gesell, and a tremendous amount of careful, painstaking work has gone into the task of standardizing them for putting together in this book.

It is invidious for one not trained in psychology to criticize the work of a very experienced and expert psychologist, but I feel that objective tests, such as those described in this book, are not enough. I believe that a baby can be assessed only against the background of a detailed history, making allowances for illness, lack of opportunity, and bad social circumstances, and omitting, in individual babies, without reducing their score, any items such as tests for speech, sphincter control, feeding, or dressing, if isolated retardation in those fields is thought to be due to factors

quite unrelated to their intelligence—for example, high tone deafness in the case of speech. Furthermore, though it would be very convenient if one could convert every test into a figure for scoring, I believe it to be impossible to do so, for such a method would ignore such vitally important and yet unscorable items as the way the child performs the tests, his interest in them, the rapidity with which he makes up his mind, his determination, and his concentration. Arnold Gesell and his staff paid a great deal of attention to all these factors; and it will indeed be difficult for anyone to improve on Gesell's methods of developmental study. Dr. Griffiths, on the other hand, pays very little attention to them in working out her "scores."

When a second edition is made I would suggest that a discussion on the meaning of intelligence, and on the possibility of predicting it in the first two years, would be valuable. It is to be hoped, furthermore, that in the next edition the printers will not split words at the end of pages, so that half a word is on one page and half on the next. For example, it is disconcerting to read (on page 25), "It is significant, perhaps, to remember that those psychologist [*sic*] who would see in a child so much that is characteristic of a chim" before turning over the page to read "panzee . . ."

All those who are interested in assessing child development will find much of interest in this book; but it will not supplant Gesell.

R. S. ILLINGWORTH.

MEDICAL RECORDS

The Proceedings of the First International Congress on Medical Records. King's College, London, September 8–12, 1952. To be obtained from the Hon. Secretary, Association of Medical Records Officers, Christie Hospital and Holt Radium Institute, Manchester, 20. (Pp. 266. 26s.) Manchester: Association of Medical Records Officers. 1953.

In keeping with the duties of hospital medical records officers—or medical record librarians, to use the American title—this record of their first international congress, which we should be proud to note was held at King's College, London, in September, 1952, is complete and informative; it even includes the human touch of small photographs of most of the speakers. During the present century the increasing frequency and complexity of hospital investigations and treatment have brought numerous related problems in the organization of hospital records. The development of standards and systems for hospital medical documentation and the training of staff for such duties have therefore proceeded fairly rapidly in some parts of the world in the last two decades, notably in the United States and in Great Britain, and about 300 delegates, including about 70 from the United States, attended this first international congress on medical records to discuss their problems and to seek common solutions.

Many of the papers and discussions are full of meat for the medical records officer and of interest for other hospital officers, both medical and non-medical. But they do emphasize that the organization of hospital records, as is only to be expected, is still in its infancy, and they make one hope that when the second international congress is held in the United States in 1956 there will be a greater consensus of opinion in favour of one or other system of nomenclature and indexing.

Among so many good papers it is perhaps invidious to single out only one or two. To the medical reader, however, the first paper—Sir John Charles's address of welcome—is perhaps the most important, and it is certainly the most attractive; it might well form part of the general reading of all medical students. It gives a fascinating description of medical records from early times and a masterly six-point summary of the qualities required in the doctor's notes—order, accuracy, brevity, balance, saliency, and selectivity. It is indeed fitting that the first paper should give such an effective reminder of the need for high quality in the individual record itself, without which all systems of medical record keeping are scarcely worth while. It is also fitting that in one of the early discussions it was so clearly stated that the fundamental duty of the records officer is to produce the record when it is wanted, the whole record, and at once.

The latter comment is not intended to belittle the importance of the points raised in so many of the other papers which attempt to work out effective methods to secure that the record officer can indeed produce the whole record and at once. It is, however, not unfair to say that in some of the papers there appears to be too much emphasis on the prospect of research work being made possible by elaborate systems of record keeping which would enable clinicians to get all sorts of statistical material on request. The value of such mass research methods is very doubtful as applied to hospitals as a whole, and the majority of them may be well advised to concentrate primarily on the simple function of being able to produce the individual record immediately on request.

Despite this word of criticism this collection of papers is indeed a mine of information which should be carefully studied in the next few years by all hospital officers whose work impinges on its contents, especially, of course, records officers themselves, and one looks forward to the 1956 papers which will emanate from the second international congress.

W. G. PATTERSON.

ON BEING WELL

Good Living: A Philosophy of Health. By A. T. Todd, O.B.E., M.B., M.R.C.P. (Pp. 224. 21s.) Bristol: John Wright and Sons. London: Simpkin Marshall Ltd. 1953.

Aldous Huxley has been credited—or should it have been debited?—with a prescription for the good life: "Routine punctuated by orgies." The author of this book disclaims at once any intention of discussing ethics; he deals in happy or healthy living. He disapproves of the Bacchanalian revel: "Alcohol . . . should not be allowed the glutton that he may the more swinishly wallow in his food trough." Quite so, but many would not follow him when he declares that alcohol should be reserved for helping depressed digestion: it is useful for depressed people too, and for the undepressed who drink for the good reason that they enjoy it. Dr. Todd indicates other sins against healthy living: eggs and milk are dangerous foods for adults and cheese is the most dangerous milk product. But he does commend many fruits such as bananas, apples, and pears; and vegetables such as onions and Jerusalem artichokes.

The book covers a very wide field and makes entertaining reading. There is no question here of a confection of the writings of others; there is clear evidence of original thinking, and the results are at times startling and provocative. The author is very much in earnest, vigorous in style, and highly didactic. There is a great deal of sound wisdom in this book, but there is chaff as well as wheat, and the non-medical reader may well be at a loss to distinguish between the two. Some of the unhappy or the unwell would no doubt benefit by taking the mixture. But most of us will probably continue to absorb in the company of our friends a number of cocktails when we can afford them, to smoke tobacco, keeping Dr. Doll and Professor Bradford Hill well in mind, and to eat the things we like to eat. And if in fact we ought not to do these things—well, it might be a pity to make ourselves unhappy by spending too much time and thought in a too diligent conscious search for perfect health.

C. METCALFE BROWN.

In 1950 an annotated bibliography on vitamin B_{12} was published by Merck and Co., Rahway, New Jersey. Much of it has now been incorporated in a new publication, *Vitamin B_{12}: Selected Annotated Bibliography, 1954*, a comprehensive collection of abstracts of papers dealing with the identification, characteristics, properties, and therapeutic use of vitamin B_{12}, and covering the period from 1948 to mid-1953. The bibliography is obtainable from the Chemical Division, Merck and Co., Rahway, New Jersey, U.S.A.

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THE ANNUAL MEETING

In discussing the proposed coat of arms for the British Medical Association, correspondents in the *Journal* and speakers at Glasgow have been quick to criticize any element in it that would seem to place too much emphasis on England. The B.M.A., they assert with self-evident truth, is British, not English, and the English no doubt, with characteristic modesty, will be the first to admit with pride that they too are British, a pride that was deepened with emotion in the speeches by the New Zealander, Sir Bernard Dawson, at the Overseas Luncheon on July 2, and by Dr. J. A. Waterman, of Trinidad, when responding for the guests at the Annual Dinner in Glasgow last Thursday. The previous three Presidents of the Association have, in order, come from South Africa, Eire, and Wales. The President for the coming session, Sir John McNee, is a Scot and a graduate of Glasgow University. The President-Elect, Dr. T. Clarence Routley, is a Canadian. The Chairman of Council, Dr. E. A. Gregg, is an Ulsterman with a Dublin degree. The newly elected Chairman of the Representative Body, Dr. Ian D. Grant, is a Scot with a Glasgow degree, and the newly elected Treasurer, Mr. L. Dougal Callander, a Scot with an Edinburgh degree. An English visitor to the World Medical Association meeting at Athens a year and a half ago was hailed by an enthusiastic Cypriot as a fellow Briton, and in his universal enthusiasm he hailed Charlie Chaplin as British too. *Civis Romanus sum* was the proud boast of the citizen of the last great empire of Western civilization, and now that its successor has become a Commonwealth held together by the symbol of the Crown the native English doctor may be pardoned if he breathes more deeply when he hears his colleagues from other lands, of differing race and creed, proclaiming themselves with confidence and pride as British and as members of an Association founded by an Englishman who was born and bred in one of the English shires.

The Annual Meetings of the B.M.A. follow a set pattern ; they conform to a common curriculum. Yet each one is different from the other. Glasgow and Sir John McNee must now be resting well content that their tasks have been accomplished and their intentions fulfilled, intentions fired by the warmth and generosity that were manifest in the behaviour of the ordinary man and woman in Glasgow no less than in the members of our host, the Glasgow Division of the B.M.A. Glasgow is indeed no mean city. Its famous shipyards and mighty river, pulsing with the energy and enterprise of vigorous men in a great industrial centre, are complemented by the university on the hill and, opposite it, one of Britain's foremost art galleries, directed by a medical man, Dr. T. J. Honeyman. Then there is that great institution the Faculty of Physicians and Surgeons founded by Maister Peter Lowe in 1599 some twenty years after the town authorities had offered salaries to doctors to induce them to practise there—a Faculty made Royal by Edward VII in 1909. It has a fine record of upholding and maintaining the standards of practice in the West of Scotland for the past three and a half centuries. The doors of the Faculty were thrown open on many occasions to those attending the Annual Meeting, and we are indebted to its President, Dr. Andrew Allison, for this great courtesy. Town joined with gown in welcoming the B.M.A., and the Lord Provost and the Vice-Chancellor made us feel that it was a pleasure to them to receive their guests in the City Chambers and the Bute Hall. It is pleasant, too, to recall the unobtrusive help given throughout the meeting by Glasgow students, who acted as guides and stewards and let us share the amenities of their pleasant Union. Among many who manned the various committees which organized the meeting it may not be invidious to mention Dr. J. Inglis Cameron and Dr. J. T. McCutcheon, the latter supported by the clerical staff of the Glasgow Regional office, to say nothing of Mrs. McCutcheon, who so unflaggingly aided Lady McNee in looking to the comfort and entertainment of the ladies. As science secretary Dr. J. Basil Rennie saw to it that the intellectual reputation of Glasgow was sustained in the excellence of the fare provided for those who attended the plenary sessions and the meetings of the scientific sections, and Mr. A. W. Kay is to be congratulated on the much improved scientific exhibition in the capacious Kelvin Hall, adjacent to the exhibition of pharmaceutical products, instruments, appliances, and medical publications.

Sir John McNee enters his year of office as President of the Association hard upon his retirement from the Chair of Regius Professor of the Practice of Medicine of Glasgow University, and he enters it with the

good will of his fellow members and their gratitude for such a memorable beginning in the city where he was educated. The attendance during the past fortnight of so many men and women from the Commonwealth adds point to the friendly criticism of the proposed coat of arms. The Association is indeed British, and under this simple designation doctors from all over the world are proud to group themselves, from Australia to Ulster, from Malaya to Nigeria, and it is fitting that this note should have been so resoundingly struck at Glasgow, many of whose sons and daughters have gone out in her ships to settle in other lands and there exemplify a way of life that still commands the respect and affection of many millions of people and many thousands of medical men and women.

THE ANNUAL REPRESENTATIVE MEETING

The public must receive a rather lop-sided view of the activities of the Association when they read the accounts of the A.R.M. in the daily papers, whose reporters naturally select for presentation and comment those topics they know will interest their readers. Anything controversial is news. What doctors earn, or their views on what they should earn, is also news, because as taxpayers newspaper readers foot the bill of the National Health Service. The casual reader of the *Daily X*, therefore, may be excused for thinking that the Representative Body, the annual doctors' parliament, is concerned principally if not solely with money. Adopting Caesar's approach to Gaul, one may divide the business of the Annual Representative Meeting into three parts: that dealing with what might be termed trade-union activities, mostly in relation to payment for work done; that concerning the medico-scientific and medico-social life of the Association; and that relating to the domestic problems of the Association. The Chairman of Council, Dr. E. A. Gregg, gave the Representative Body at the outset of its meeting an excellent and succinct survey of the activities of the B.M.A. during the past year—a year notable for the production of many valuable reports and memoranda on such subjects as the provision of medical and dental services to the armed Forces, on health visitors, on the training of district nurses, on the rehabilitation and resettlement of disabled persons, on the occupational health services, on meat inspection, on the care of the aged and chronic sick, on divine healing, and so forth. All this showed, Dr. Gregg pointed out, that the Association devoted much of its time and resources to considering the larger questions affecting the good of the community as a whole. To these might be added the activities of the Science Committee in awarding prizes and scholarships to doctors and students, and nurses, and in maintaining a first-class library. All this solid and constructive work goes on steadily year after year, and the Press gives it valuable publicity as the months go by. But when the Annual Meeting comes round the sound of brass and the tinkling of cymbals seem to drown the quieter instrumentalists in the orchestra.

The remuneration of medical men and women in a State-sponsored National Health Service is bound to be a matter of controversy and disquiet for some time to come, and there should be no need to apologize for the fact that the R.B. shows a lively interest in the subject. The traditional relationship between the doctor and his patient has been interrupted by the intrusion of that formidable third-party, the State, represented in this by the Ministry of Health manned by civil servants and the Minister of Health, who, by the nature of things, is first and foremost a politician. This intrusion of the State into Medicine is something to which doctors do not take readily: Mr. Bevan made the matter brutally clear when he said that the National Health Service was at the centre of politics —was in the place doctors think it should not be. This relationship between Medicine and the State is fraught with great difficulties and dangers. Only continued vigilance and courage of decision will enable Medicine to preserve its essential freedoms as a learned profession in the face of the power of the politician and the public purse. Some such thoughts must have been at work in the Representative Body at Glasgow when over a fortnight ago they debated the recent agreement on remuneration of consultants and hospital medical staff between the Staff and the Management Sides of Whitley Committee "B." If it is true that the R.B. is composed mostly of general practitioners then it may be said that they could approach this subject relatively free from bias. It is certainly true that they were deeply concerned with the principles behind the agreement, that they were dismayed to find a Government breaking its bond by refusing to implement recommendations in a report (the Spens Report) which had played a significant part in persuading consultants, specialists, and hospital medical staff to enter the National Health Service some six years ago: recommendations, moreover, which had been accepted by the Government of the day, as well as by the medical profession. It is difficult to relate an agreement which will result in some new consultants getting less than their predecessors to the repeated assertions of some that there has been no breach

in the Spens Report; it is difficult to reconcile the statement that the agreement will not be upset within a short period of years with the statement that full implementation of the Spens recommendations is now to be pressed on vigorously. A paradoxical situation is made more paradoxical when, as reported, a member of the Staff Side said at Glasgow, "What has happened was that an award had been accepted that had no relation to Spens." The Representative Body therefore with overwhelming majorities resolved: "That this meeting is dissatisfied with the recent consultants award and the reasons given therefor"; and, "That this meeting deplores the inadequacy of the recent agreement reached on the remuneration of hospital medical staffs, and urges that steps be taken to reopen this matter immediately, with a view to obtaining the implementation of the Spens Report as applied to consultants and specialists and obtaining adequate betterment. In the event of disagreement the matter should be referred to arbitration." It has sometimes been suggested that the R.B. should not concern itself with the remuneration of consultants and hospital medical staff. But the R.B. is the policy-making body of the B.M.A.; it has among its members representatives of all branches of medicine; it is concerned to preserve the unity of the profession in, among other things, its approach to government; and its long experience has taught it the importance of insisting that the politician should stick to his word. At the A.R.M. at Cardiff last year Dr. T. Rowland Hill struck the right note when he said, "It might suit the dictates of political expediency to regard the [Spens] Report as obsolete, but that was something to which the representatives of the profession would never agree." If it is true that the recent agreement has restored the balance between the remuneration of general practitioners and that of consultants and specialists, and hospital medical staff, then it is fair to deduce that this balance was wrongly struck in the two Spens Reports, though both were accepted at the time of their publication by both profession and Government. Whatever are the rights and the wrongs of recent controversy it would seem that the time is now opportune for a co-ordinated investigation of the remuneration of the medical profession. This matter was put to the R.B. most cogently by Dr. J. G. M. Hamilton, and after a careful debate the R.B. passed the following variation of Dr. Hamilton's motion: "That the Council be instructed to set up a committee to consider the whole question of medical remuneration and to make recommendations designed to establish a general Association policy on the remuneration of doctors." This will indeed be a formidable task, but none the less necessary for that. It will require great forbearance on the part of those members of the committee inevitably having sectional interests at heart, and the abandonment on the part of others of dearly cherished prejudices. But here at least is a frontal approach to the problem of securing unity in the profession on a matter closely affecting its welfare and status in the community it serves.

The other matter which also took up much of the time of the Representative Meeting was the debate on the scheme for restoring the right to buy and sell general practices in the National Health Service. The Amending Acts Committee was complimented on the hard work they had put in in preparing the scheme, and on the sincerity with which it was presented by its chairman, Dr. H. H. D. Sutherland. Few other debates at the A.R.M. have reached such a high level, and argument was countered by argument in an atmosphere remarkably free from the emotional reaction this subject so often provokes. The debate was fully reported in last week's *Supplement*, and space does not permit a recapitulation of it here. No one can have failed to be impressed by the ideals inspiring the advocates of the restoration of buying and selling practices—a fervent belief in individualism, in thrift and hard work; and an equally ardent belief that the restoration of this custom would secure general practice against that Leviathan the State and against the much-feared introduction of a whole-time salaried State Service. The opponents doubted the practicability of the scheme put before them, and with equal sincerity feared that the restoration of buying and selling practices would impose an intolerable financial burden on the young man at a time when the burdens are heavy enough from other causes. The voting on some of the motions and amendments was close. The motion that a plebiscite be held on the question was lost by 152 votes to 143. An amendment to the effect that the Council take steps to try to regain the right of buying and selling was lost by 155 votes to 93. Finally, 133 voted for and 124 against the following motion: "That this meeting considers that the restoration of the right to buy and sell goodwill of medical practices in the National Health Service is impracticable."

The reports of the A.R.M. in this and last week's *Supplement* have taken up more space than is usual, and will, it is hoped, be read carefully by members of the B.M.A. unable to be present. It struck more than one observer of the scene that the R.B. followed the business closely and intervened effectively. In spite of the controversial nature of the two principal

themes the meeting remained level-headed and harmonious. This was in no small part due to the moderating words of the Chairman of Council, Dr. E. A. Gregg when he introduced the Annual and Supplementary Annual Reports of Council, and to the masterly and fair conduct of the meeting by Dr. S. Wand, who received a great ovation when Dr. Gregg announced that he was to be presented with the Gold Medal of the British Medical Association, a fitting recognition of his many great services to the Association, recorded in the citation published in this week's *Supplement*.

HYDROXYTRYPTAMINE

The discovery of substances which have great physiological activity and are normally present in the body has every so often aroused great interest since the discovery of adrenaline nearly sixty years ago. Some substances such as acetylcholine and histamine have excited attention before they were known to occur in mammalian tissues. Another has now been discovered to be present which resembles histamine in the sense that it is derived from a well-known amino-acid by removal of the –COOH group. Just as histamine is related to histidine, so hydroxytryptamine is related to tryptophan, with the slight difference that a hydroxy group has been added to the ring. The discovery has come from two directions. Erspamer, working in Italy, has published papers since 1940 on the activity of extracts of the intestinal mucosa of mammals which he believed was due to a substance he called enteramine; he found similar activity in the posterior salivary glands of the octopus. In 1952 he and Asero[1] isolated a pure compound and found it to be identical with hydroxytryptamine. The second direction from which the discovery has come is from the work of Rapport, who in 1948, together with Green and Page,[2] attempted to find what the substance was which is set free in serum after blood is removed from the body, and which has been called by various names such as vasotonin or serotonin because it has a powerful vasoconstrictor action. In 1949 Rapport[3] concluded that the substance was hydroxytryptamine, and this was confirmed when hydroxytryptamine was synthesized.

So far as mammalian tissues were concerned, evidence of the normal presence of hydroxytryptamine was provided only by the indication of Erspamer that it occurred in intestinal mucosa, but in 1953 its presence in the brain was demonstrated independently by Amin, Crawford, and Gaddum[4] and by Twarog and Page.[5] From this point hydroxytryptamine became a substance of much more importance, and several attempts have been made to obtain a hint of what its function may be. The problem of its function in the brain is naturally the most difficult one to solve. Drs. D. W. Woolley and E. Shaw describe their studies on it at p. 122 of the *Journal* this week. They have synthesized several substances with a structure similar to that of hydroxytryptamine in the hope of finding an antagonist. Since the discovery that *p*-aminobenzoic acid antagonizes the action of sulphonamides many attempts have been made to find what Woolley calls antimetabolites. Action as an antagonist can be measured on smooth-muscle preparations in an isolated organ bath, and a highly active antagonist to hydroxytryptamine was found in the substance Woolley and Shaw call medmain. Although this antagonized hydroxytryptamine on the rat uterus, it was unable to antagonize the pressor effects of hydroxytryptamine in normal dogs. The only sign that it might antagonize hydroxytryptamine in the brain was that it produced convulsions in mice, but these were not prevented by giving excess hydroxytryptamine.

More interesting results have come from the finding of Gaddum and his colleagues[6] that lysergic acid diethyl amide, often referred to as L.S.D., is a potent inhibitor of hydroxytryptamine. When taken by mouth even in very small quantity this substance produces mental changes which have been said to resemble those present in schizophrenia. Here is at least a plausible case for the view that these striking mental changes may perhaps be related to inhibition of the action of the hydroxytryptamine in the brain, and that schizophrenia itself may be due to a deficiency of hydroxytryptamine. The changes include hallucinations of different kinds. The subject may identify himself with one or more other persons, or he may relive suppressed memories, or feel himself to be depersonalized, and so on. A description of the changes has been given recently by Sandison, Spencer, and Whitelaw,[7] who believe that L.S.D. may be used to enable patients to recall past memories and experiences and to benefit from doing so.

It is much too early yet to know whether Woolley's general theory is right that various other substances such as harmine and yohimbine which produce mental changes do so by interfering with the action of hydroxytryptamine in the brain. It is a theory which

[1] *Nature (Lond.)*, 1952, **169**, 800.
[2] *J. biol. Chem.* 1948, **176**, 1243.
[3] Ibid., 1949, **180**, 961.
[4] *Abstract XIX int. Congr. Physiol.*, p. 165, 1953.
[5] *Amer. J. Physiol.*, 1953, **175**, 157.
[6] *Quart. J. exp. Physiol.*, 1953, **38**, 255.
[7] *J. ment. Sci.*, 1954, **100**, 491.
[8] Ibid., 1954, **100**, 29.
[9] *Fed. Proc.*, 1954, **13**, 162.
[10] *Brit. J. Pharmacol.*, 1954, **9**, 240.

shows signs of extending rapidly in other directions. Hoffer, Osmond, and Smythies[8] have described the hallucinations which have followed the injection of adrenochrome, a substance which many have thought might arise in the body from a change in the molecule of adrenaline. They point out that, if it is true that it is a normal breakdown product of adrenaline, then it is the first naturally occurring substance to be shown to cause hallucinations. Thus mental disturbances may arrive from abnormal adrenaline breakdown as well as from a deficiency in hydroxytryptamine formation. The formula of adrenochrome suggests that it too might act as an inhibitor of hydroxytryptamine.

While these observations with L.S.D. and adrenochrome will no doubt be followed by much further experimenting, more solid progress is being made on a less exciting plane. Welsh[9] has obtained strong evidence that the nerve fibres which accelerate the heart of the shellfish *Venus mercenaria* do so by liberating hydroxytryptamine. Gaddum and Hameed[10] have shown that, like acetylcholine, hydroxytryptamine has two kinds of action, one on muscle tissue which is antagonized by L.S.D. and the other on ganglia which is not antagonized by L.S.D. but only by excess of hydroxytryptamine. They have made a strong case for the view that in the peripheral tissues there are specific receptors for hydroxytryptamine, which would suggest that it has a normal function in them. Patient work of this sort will discover what it is.

SURGERY OF FALLOT'S TETRALOGY

In February, 1953, Drs. M. Campbell and D. C. Deuchar[1] reported in this *Journal* the results of operation in 200 cases of congenital heart disease with cyanosis, treated by the Blalock–Taussig procedure of anastomosing a systemic artery to one of the pulmonary arteries. The results of direct operations on pulmonary stenosis were not then given, but they are now recorded in our opening pages this week in an article by the same authors, with the collaboration of Sir Russell Brock, who give an account of the results of pulmonary valvotomy and infundibular resection in 100 cases of Fallot's tetralogy. Each type of operation has the same aim: the increase of the pulmonary blood flow. Over four-fifths of the patients in the first series, and all those in the second, had Fallot's tetralogy; cases of isolated pulmonary stenosis are also treated by pulmonary valvotomy, but have not been included. The congenital heart deformities in the tetralogy consist of stenosis of the outflow tract of the right ventricle; patency of the interventricular septum, the opening lying in the upper part; dextroposition of the aorta, which receives blood from both ventricles; and enlargement of the right ventricle. The stenosis may lie at the pulmonary valve, the cusps being fused and the orifice nipple-like; somewhat more commonly it lies in the infundibulum of the ventricle, the channel being narrowed over more or less of its length. The infundibular stenosis may lie at a low level, or immediately beneath the pulmonary valve, which is often normal. Quite frequently both types of obstruction occur in the same heart. The direct operation increases the blood supply to the lungs by diminishing or removing the obstruction. The type and level of stenosis may be suggested before operation by angiocardiographic appearances, or more reliably determined by cardiac catheterization with an electric manometer. As the catheter is slowly withdrawn through the pulmonary valve and right ventricle, a continuous pressure reading is made; the shape of the curve is significant, and the tip can be observed with a fluoroscopic screen, the level at which the pressure falls being noted. A corresponding manœuvre can alternatively and perhaps more conveniently be done at the time of operation, inserting the catheter through the wall of the right ventricle, and correlating the findings with the appearances and with those obtained by palpation or probing. The level of the obstruction being determined, appropriate instruments, designed by Sir Russell Brock, can be inserted through a small cardiotomy incision. A valvotome and metal dilators are used for a valvular stenosis; the narrowed infundibular area is resected with a punch. After the instrumentation pressure records are again taken. Until the results show an adequate relief of the stenosis the instrumentation is repeated—several times if necessary. Care must be taken to avoid overcorrection, which would lead to excessive pulmonary flow.

The results of the direct operation now reported by Campbell, Deuchar, and Brock are very similar to those of the anastomotic operation previously reported. Two-thirds of the patients subjected to the direct operations have had good or very good results; one-sixth are improved; and one-sixth died. Two-thirds of the other group also had good or very good results, and 12% died. Sixty-one cases of the present series have been analysed in detail, and followed for at least one year. Two-thirds were children aged less than 15 years, slightly more boys than girls. Twenty-three of the patients had very good results; they now live a normal life, except for the more vigorous activities, can walk several miles, and usually play games or go dancing. Eleven patients had good results, now leading a normal but quiet life. Ten patients were improved. Eleven patients died after operation. The final degree of improvement, though usually rapidly attained, as after anastomotic operations, was in some cases delayed for several months.

The operation seldom led to any noticeable change in cardiac physical signs. Pulmonary regurgitation occurred only in two cases. Cyanosis was reduced in all, and sometimes disappeared altogether; finger clubbing regressed. The haemoglobin percentage fell almost to normal levels. The heart enlarged, as after anastomotic operations, presumably because the increased cardiac

[1] *British Medical Journal*, 1953, 1, 349.
[8] Ibid., 1954, 1, 1310.

output now possible gave it more work to do. The increase is sometimes considerable; it mostly seems to take place during the first year. The authors report with great thoroughness changes in electrocardiograms early and late after operation and in the findings on cardiac catheterization. Alterations in T-waves are common. The right-to-left shunt is reduced, and the arterial oxygen saturation rises. Intracardiac pressures do not change much. There is surprisingly little rise in pulmonary artery pressure, but the pulmonary blood flow is increased; from being roughly half the value of the systemic flow it becomes approximately equal to it. Results of valvotomy were very similar to those of infundibular resection. The latter carries a higher mortality rate—18% as compared with 11%. Valvotomy, alone or combined, did not so certainly lead to a good result in the survivors.

No comparable series of direct operations has been reported elsewhere. Indeed on the whole most surgeons prefer to treat Fallot's tetralogy by the already established anastomotic operation, which in most hands probably carries a lower mortality. The aim of surgery should be to correct deformities when possible, not to add to them: the direct operation is the first step in this direction for this disease—and this paper shows that short-term results can be as good as those of the anastomotic procedure. The next step will be closure of the ventricular septal defect—a step which cannot be far away, since techniques for operating on the heart are advancing rapidly.[2]

HEALTH SERVICE REPORT

Another year's useful work by the Central Health Services Council is summarized in its annual report for 1953, published last week.[1] The only point on which the Minister of Health has differed from the advice given by the council is whether or not some control should be exerted over immigrant workers entering the country suffering from tuberculosis. The problem is a small one, and after studying it the Standing Tuberculosis Advisory Committee of the council advised that the figures did not indicate a serious menace to the health of the country. The committee found that in a certain week in 1953 only 3 per 1,000 occupied tuberculosis beds were occupied by people thought to have had tuberculosis on arrival in Britain. How many of those people infected others with the disease is a matter for speculation—though not touched on in the report. At any rate, the council differed from its committee and thought that "some form of control should be introduced." The Minister concluded, however, that the facts "do not justify the elaborate and unwelcome controls that would be necessary."

In this litigious age a matter of topical interest is an investigation carried out by a subcommittee of the council into the accidental injection of wrong solutions into hospital patients. While the prevention of this kind of mishap is largely a matter of common sense, the report makes a few suggestions that may offer subsidiary assistance. One of these is that no colouring matter should be added to any injectable fluid, while naturally colourless fluids not used for injecting but supplied to operating theatres should be artificially coloured. Advice is given on how to print the name of the drug on the ampoule (it should, for instance, "run parallel to the long axis"), and so far as possible all injectable fluids should be made up in ampoule form. A method of sterilizing ampoules in formaldehyde vapour is described in detail. Again, the report discusses the best methods of storing dangerous drugs, and it draws attention to the risk of giving only verbal orders for them. But when all is said and done, it is up to the person giving the injection to read the label on the container, for this is "the most effective single precaution that can be taken against accidents."

The hospital pharmaceutical services come in for some discussion, and here part of the problem is the status of pharmacists, perhaps inadequately recognized in the hospitals. Salaries are low compared with what can be earned outside with comparable experience, and pharmacists have to do too many extraneous duties. Reorganization should be "based on the recognition that pharmacy is a science and an art of its own," and decisions on pharmaceutical matters should be made by pharmacists. In other words, the report rightly recommends that some increase in status of the hospital pharmacist is desirable, for he seems to have lost some ground in the general scramble for status that has become so conspicuous a consequence of high taxation in these post-war years.

P.R.C.S.

Sir Harry Platt has been elected President of the Royal College of Surgeons in succession to Sir Cecil Wakeley, thus becoming, we believe, the first specialist surgeon to hold this high office. Sir Cecil followed the example of his predecessor, Lord Webb-Johnson, in making the College not only a fine habitation but a centre of surgery that attracts surgeons from all over the world, the recent meeting there of the American College of Surgeons being the most notable evidence of this. Sir Cecil retires with the gratitude of his colleagues for the work he has done. Sir Harry Platt is a brilliant example of a man who overcame early physical disability to carve out a career—fittingly in orthopaedic surgery, in which he became a master of his subject and indeed made it one which has attracted many of the ablest men in the craft. Inspired by the work of Sir Robert Jones, whose patient he was, Sir Harry Platt was also profoundly influenced by the Boston school of surgery when he spent a year at the Massachusetts General Hospital just before the war of 1914–18. His reputation is world-wide. As well as being a great surgeon, he has applied his active and well-stocked mind to the wider problems of medicine, of medical administration, hospital organization, and medical education. He thus brings a many-sided experience to bear upon the welfare of the College over which he is now to preside.

[1] *Report of the Central Health Services Council for the Year Ended December 31, 1953.* H.M.S.O., 1s. 6d.

THE COLLEGE OF GENERAL PRACTICE OF CANADA

[FROM A SPECIAL CORRESPONDENT]

Canada now has a College of General Practice resembling in its aims those bodies already existing in the United States of America and the United Kingdom. The College was inaugurated at the annual meeting of the Canadian Medical Association in Vancouver, British Columbia, in June, 1954. Unlike its American counterpart, the Academy of General Practice, this new college has had the support and interest of the national medical association from the start. Indeed, it arose from the suggestion of a former C.M.A. president in 1946 that something should be done to improve the lot of the Canadian general practitioner, and is the product of several years of study by a committee set up by the C.M.A. Moreover, it is clearly laid down in the statutes that every member of the new College must be a member of his provincial and national medical associations. It is true that there is a Section of General Practice within the C.M.A., but this does not care for the purely educational needs of the practitioner; the latter will be the task of the College.

Aims and Constitution

Broadly speaking, the aims of the College are better care for the patient and better opportunities for the family doctor. Its objectives have been defined as follows:

1. To establish an academic body with educational aims.
2. To arrange for undergraduate teaching by and for general practitioners.
3. To arrange for the presentation of postgraduate education for general practitioners.
4. To arrange for research in general practice.
5. To arrange for publication of original articles by general practitioners.
6. To arrange for hospital staff appointments for general practitioners.
7. To provide suitable recognition to members in the field of general practice.
8. To do all things necessary to maintain the high standard of general practice.

Dr. MURRAY STALKER, of Ormstown, Quebec, was appointed president for the present year, and Dr. VICTOR JOHNSTON, formerly a general practitioner, the executive director. The general conduct of affairs of the College is placed in the hands of a board of representatives, composed of an executive committee of five members plus one representative from each of the ten provinces, except the most thickly populated ones of Ontario and Quebec, which are allowed two each. The executive director is a full-time employee of the College.

Those unfamiliar with Canada must bear in mind that the nature of the country makes it desirable in any organization of national size to have a series of provincial organizations, each capable of almost independent action. It is expected that Provincial Chapters of the College of General Practice will be speedily formed, and that much of the work of the College will be done through them.

Standards of Active Membership

Three types of member are envisaged: honorary, active, and associate. Honorary members will be persons who have already made an outstanding contribution to the cause of general practice in Canada. Associate members will be those not yet eligible for full membership but working towards the latter.

The rules for active membership are fairly severe, and in no case will such membership be conferred for more than two years at a time. At the end, renewal of membership will depend upon the applicant's having undertaken 100 hours of postgraduate study during the preceding two years. A credit system makes it possible for the doctor to make up his 100 hours by attendance at formal medical society meetings, attendance at postgraduate courses approved by the College, participation in hospital rounds, and such activities as reading courses, book reviewing, submission of scientific papers or case reports, and community service. Credits are to be assessed by a committee in each province in consultation with a central committee, thus combining a knowledge of local conditions with conformity to a standard.

At the onset, it is required that active members should have conformed with the above programme, that they should have been in general practice for five years or its equivalent, and conducted their practice on a high moral and ethical plane, and that they should be willing to undertake the necessary study for continued membership.

Educational Programme

In outline the College's educational programme is as follows:

1. *Undergraduate Training.*—It is hoped that the College will be able to make suggestions from time to time for the inclusion in undergraduate training of material more suited to the future general practitioner.

2. *Intern Training.*—Similarly, it is hoped to frame in conjunction with hospitals—particularly smaller hospitals—suitable programmes for the training of interns intending to become general practitioners.

3. The College supports the early establishment of a postgraduate school for short, intensive courses for general practitioners.

4. *Fellowship in General Practice.*—A special committee is to establish standards qualifying outstanding general practitioners for fellowship. Possession of the fellowship should qualify practitioners for such responsibilities as teaching appointments in hospitals and universities.

5. Plans are being made for guided research in general practice.

Inauguration Ceremony

The College was actually launched at a series of meetings during the C.M.A. annual meeting this year, at which it was learned that very gratifying enthusiasm had already been shown for the project, and that a considerable number of applications for membership had already been made. The C.M.A. has helped by voting aid to the extent of $10,000 during the next three years.

The first president of the College, Dr. Murray Stalker, was installed at a luncheon on June 17. In his presidential address, he declared that the basic unit of society was the family and that an integral part of that unit was the family doctor, who should be the finest flower in the field of medicine, though paradoxically the recent advances in medicine had tended to drive him out. In paraphrasing Marie Antoinette, he said that the public were being asked to eat the expensive cake of specialism instead of the good bread of general practice. He emphasized that the aim of the College was in no way political but purely educational.

The College must attempt to direct undergraduate education towards the diagnosis of the whole patient, he continued. The main task of the general practitioner of the future would be the study of the earliest symptoms and signs of disease, with a view to arriving at an accurate diagnosis in the majority of cases. It was the job of organized medicine to help to distribute the benefits of advances in medicine to every citizen at a price within his range.

A pleasing feature of the inaugural meeting was the gift by the retiring general secretary of the C.M.A., Dr. T. C. Routley, to the College of a gavel sent to him by the Medical Society of the Island of Cos, and said to come from the plane tree under which Hippocrates had once taught. Another pleasing feature was the playback of a recorded message from the president of the corresponding college in the United Kingdom, Dr. W. N. Pickles, of Aysgarth, in which he said, "On the shoulders of the family doctor rests the care of the people."

RECOMMENDATIONS ON THE USE OF ANTIMALARIAL DRUGS

PREPARED BY THE MALARIA SUBCOMMITTEE* OF THE COLONIAL MEDICAL RESEARCH COMMITTEE

In 1949 the Colonial Medical Research Committee drew up recommendations on the use of "paludrine" (proguanil) in suppression and treatment of malaria; these were tentative on the basis of knowledge available at the time and were stated to be subject to revision in the light of future experience and experiment. The additional experience since gained makes it advisable to revise the recommendations and also to indicate the suitable methods of use of the different antimalarials now available. The revision is specially necessary in view of the further evidence which has been obtained that (*a*) some drugs which are effective in suppression of malaria are unsuitable for use in the treatment of the overt attack owing to their slow schizontocidal action, and that (*b*) the unsuitable use of certain antimalarials for suppression or for treatment of the overt attack may result in the development of drug-resistant strains of the malaria parasites.

No single drug at present available is effective against all phases of the cycle of development of the malaria parasite; the preparation to be used for a particular purpose will be that active against the appropriate phase. The purposes for which antimalarial drugs are used are:

1. For causal prophylaxis or suppression (destruction of the parasite in the pre-erythrocytic phase or in the asexual erythrocytic phase).
2. For treatment of the overt malarial attack (destruction of the asexual parasites in the blood stream).
3. For radical cure of vivax and quartan malaria (destruction of the late exo-erythrocytic forms).
4. For prevention of transmission (destruction of the gametocytes in the peripheral circulation or interruption of sporogony in the mosquito).

Causal Prophylaxis or Suppression

The onset of a clinical attack of malaria can be prevented either by a drug acting on the pre-erythrocytic forms of the parasite (causal prophylaxis) or by one acting on the asexual erythrocytic forms (suppression).

Causal Prophylaxis.—The 8-aminoquinolines (pamaquin, primaquine) show such action, but the margin between the prophylactic and the toxic dose is too narrow to permit of their use for this purpose. The only drugs which can achieve this effect with safety are the biguanides (proguanil) and the diaminopyrimidines (pyrimethamine): their action in this respect is definite so far as falciparum infection is concerned. Since, however, they act also on the asexual erythrocytic forms of all species of human Plasmodia their use as protective drugs is by no means confined to falciparum infections.

Suppression.—Drugs used for suppression show the following characteristics, advantages, and limitations:

Quinine, formerly widely used for this purpose, has several disadvantages. For the effective suppression of falciparum malaria, it may have to be taken in doses as high as 10 gr. (0.65 g.) daily, and in New Guinea even this dosage has proved insufficient. Apart from the unpleasant side-effects which may arise from prolonged administration of this amount of quinine, its association with the precipitation of blackwater fever makes it unsuitable for use as a suppressant in areas where falciparum infections are prevalent.

Mepacrine is a very effective suppressant of all forms of malaria, but has certain disadvantages which detract from its usefulness. When taken over long periods it sometimes produces skin lesions, the most common of these being a lichenoid dermatitis. Yellow discoloration of the skin, a usual feature, is a further disadvantage.

Chloroquine and *amodiaquine* are probably even more powerful suppressants than mepacrine. Their action resembles that of the last-named drug, but they are on the whole less toxic and they do not tint the skin.

Proguanil and *pyrimethamine*, as well as being causal prophylactics in falciparum infections, are effective suppressants of all forms of malaria. They also have the advantage of preventing the completion of sporogony and of being considerably less costly than the 4-aminoquinolines. There is, however, a possibility that drug resistance may appear in areas where either of these compounds is in common use, particularly if they are employed indiscriminately as therapeutic agents, though proved examples of this are very rare. Cross-resistance has been shown to exist between proguanil and pyrimethamine, so that if resistance to either of them becomes apparent a switch-over to chloroquine, amodiaquine, or mepacrine is indicated; or, if none of these is available, to quinine.

Treatment of the Overt Attack

As a general principle in areas where drug prophylaxis or suppression is in operation, a different drug should be used for treatment of the clinical attack.

In Non-Immune Subjects.—For this class of patient it is necessary to employ one of the more powerful schizontocidal drugs, such as chloroquine, amodiaquine, mepacrine, or quinine.

Quinine has the disadvantage of its association with the precipitation of blackwater fever, and is comparatively ineffective against certain strains of malaria parasites. It cannot be relied upon to effect radical cure of infections with some strains of *P. falciparum*.

Mepacrine has a rapid action in all forms of malaria, but minor toxic manifestations and occasional psychoses of a more serious nature are definite drawbacks. The yellow tinting of the skin sometimes produced is also undesirable.

Chloroquine and *amodiaquine* are probably the most effective agents for terminating the clinical attack, and toxic manifestations of a serious nature are rare with either drug.

Neither proguanil nor pyramethamine is sufficiently rapid in action to warrant its use in the treatment of malaria in non-immune subjects.

In Subjects Partially Immune.—For the dispensary treatment of partially immune indigenous inhabitants of malarious countries a single-dose treatment with chloroquine, proguanil, amodiaquine, or mepacrine has proved effective. Good results have also been reported with pyrimethamine given as a single dose. In view of the possibility of drug resistance arising from both proguanil and pyrimethamine it seems wiser to reserve these drugs exclusively for prophylaxis and suppression and to use for therapeutic purposes chloroquine, amodiaquine, mepacrine, or quinine. If quinine is used, two to five days' treatment is usually necessary.

For Emergency Treatment.—In the treatment of pernicious forms of malaria, whether cerebral, algid, or gastrointestinal, oral administration of drugs is seldom practicable, and, since prompt action is necessary to save the patient's life, antimalarial drugs must be given parenterally in such cases. Quinine dihydrochloride intravenously has been a standard and successful treatment for many years. Mepacrine methane sulphonate may be given intramuscularly as an alternative. Recent work indicates that chloroquine is equally successful when given intramuscularly or intravenously. The intramuscular injection of quinine, still widely practised in many countries, has the disadvantage that it causes necrosis and may produce abscess. Whatever is used, as soon as the patient is able to take drugs by the mouth, all further medication should be by this route.

Radical Cure

Vivax and Quartan Malaria.—The only drugs which are effective against the late exo-erythrocytic forms of the parasite are the 8-aminoquinolines. Pamaquin has been used for this purpose for many years, but recently primaquine has

*Brigadier J. S. K. Boyd, F.R.S. (*chairman*), Professor P. A. Buxton, F.R.S., Major-General Sir Gordon Covell, Sir Neil Hamilton Fairley, F.R.S., Professor P. C. C. Garnham, Dr. R. Lewthwaite, Professor G. Macdonald, Professor B. G. Maegraith, Sir Eric Pridie, and Dr. F. Hawking (*secretary*).

been shown by American workers to be more effective and less toxic. If an overt attack is in progress standard treatment with a schizontocidal drug should precede or accompany the course of pamaquin or primaquine. (Mepacrine should not be given concurrently with any of the 8-aminoquinoline drugs.) This combined treatment is also applicable when falciparum malaria occurs in association with vivax or malariae infections. Treatment of chronic relapsing malariae (quartan) infections is the same as for vivax cases.

Ovale Malaria.—Many infections with *P. ovale* end in spontaneous recovery. Treatment with 8-aminoquinolines is not usually necessary.

Falciparum Malaria.—There is convincing evidence against the existence of late exo-erythrocytic forms of *P. falciparum*. Any relapses that may occur are due to the persistence of erythrocytic forms. Any of the more powerful schizontocides mentioned above will usually effect radical cure.

Prevention of Transmission

The 8-aminoquinolines are the only drugs which are able to destroy the sexual forms of *P. falciparum* in the peripheral blood. Proguanil and pyrimethamine have no demonstrable action on the gametocytes in the blood, but both have the property of preventing them from undergoing full development in the mosquito, so that mosquitoes feeding on patients taking either of these drugs are unable to transmit the disease to others.

SUGGESTED DOSAGE

Unless otherwise stated the dosage suggested is for adults. That for children should be calculated according to age and weight.

Causal Prophylaxis and Suppression

(i) *Proguanil Monohydrochloride.*—Adults, 100 mg. daily; children, 0 to 5 years 25 mg. daily, 6 to 12 years 50 mg. daily; adults partially immune, 300 mg. once weekly. Or (ii) *Pyrimethamine.*—Adults, 25 mg. weekly; children, 0 to 5 years 6.25 mg. weekly, 6 to 12 years 12.5 mg. weekly. Or (iii) *Chloroquine diphosphate or sulphate.*—Adults 300 mg. base weekly. Or (iv) *Amodiaquine dihydrochloride dihydrate.*—Adults, 400 mg. base weekly. Or (v) *Mepacrine Hydrochloride.*—Adults, 100 mg. daily; adults partially immune, 300 mg. once weekly. Or (vi) *Quinine sulphate or dihydrochloride.*—Adults, 650 mg. (10 gr.) daily. Quinine is recommended only when none of the drugs listed above is available.

No suppressive regimen will be effective unless followed with the utmost regularity.

In the case of persons who have been resident in an endemic area for some time, or who have otherwise been exposed to malaria infection, a full therapeutic course should be taken before entering on a suppressive regimen if there are grounds for suspecting active or latent falciparum malaria.

If mepacrine is the drug employed, administration should be commenced 14 days before entering an endemic area. Administration of the other drugs should be commenced immediately before entry.

If the drug used is not affording protection in the dosage recommended, when taken regularly, a change should be made to another suppressive. The prophylactic regimen should be continued for one month after leaving an endemic area.

Treatment of the Overt Attack

For Non-Immune Subjects.—(i) *Chloroquine diphosphate or sulphate*, 600 mg. base, followed in six hours by 300 mg. base, then 300 mg. base daily for two days. Or (ii) *Amodiaquine dihydrochloride dihydrate*, 600 mg. base followed by 400 mg. base daily for two days. Or (iii) *Mepacrine hydrochloride*, 300 mg. t.d.s. on first day, 300 mg. b.d. on second day, then 100 mg. t.d.s. for five days. Or (iv) *Quinine sulphate or dihydrochloride*, 650 mg. (10 gr.) t.d.s. for 7 to 10 days.

For Subjects Partially Immune.—(i) *Chloroquine diphosphate or sulphate*, 600 mg. base in single dose. Or (ii) *Amodiaquine dihydrochloride dihydrate*, 600 mg. base in single dose. Or (iii) *Mepacrine hydrochloride*, 300 to 500 mg. in single dose. Or (iv) *Quinine sulphate or dihydrochloride*, 1,000 to 1,500 mg. (15 to 20 gr.) daily for two to five days. necessary. Or (iii) *Chloroquine salts.* The *hydrochloride* 650 mg. (10 gr.) in sterile normal saline injected intravenously and repeated in six hours if necessary. Not more than three injections should be given within 24 hours. Distilled water can be used as a solvent if the volume does not exceed 10 to 15 ml. It is imperative that quinine be injected slowly, at a rate not exceeding one grain per minute. Or (ii) *Mepacrine methane sulphonate*, 375 mg., or *mepacrine hydrochloride*, 300 mg., intramuscularly, repeated in six hours if necessary. Or (iii) *Chloroquine salts.* The hydrochloride is given intramuscularly in dosage of 200 to 300 mg. of base (supplied in ampoules in aqueous solution), repeated in six hours if necessary, and intravenously, 400 mg. of base in 500 ml. normal saline by intravenous drip over a period of one hour. The *sulphate* supplied in 5 ml. ampoules (40 mg. base to 1 ml.) is given in dosage of 200 mg. base intravenously, repeated after eight hours if necessary.

Radical Cure of Vivax and Quartan Malaria

(i) *Pamaquin naphthoate*, 8–10 mg. base t.d.s. for 10 to 14 days. Or (ii) *Primaquine diphosphate*, 15 mg. base daily for 14 days, or 7 mg. thrice daily for 14 days.

During an overt attack a course of treatment with a schizontocidal drug must also be given. This applies also when falciparum malaria is associated with either vivax or a malariae infection. Some authorities include treatment with a schizontocidal drug even though no active symptoms are apparent.

Careful supervision is necessary over patients taking any of the 8-aminoquinoline drugs, because of the occasional unpredictable occurrence of acute intravascular haemolysis with or without haemoglobinuria.

APPENDIX

Dose of Antimalarial Per Tablet

Each 261 mg. tablet of *amodiaquine dihydrochloride dihydrate* salt contains 200 mg. of base.

Each 250 mg. tablet of *chloroquine diphosphate* salt contains 150 mg. of base.

Each 200 mg. tablet of *chloroquine sulphate* salt contains 150 mg. of base.

Each 100 mg. tablet of *mepacrine hydrochloride* contains 79 mg. of base.

Each 375 mg. ampoule of *mepacrine methane sulphonate* is equivalent to 300 mg. of *mepacrine hydrochloride*.

Each 18 mg. tablet of *pamaquin naphthoate* or 10 mg. tablet of *pamaquin dihydrochloride* contains 8 mg. of base. For practical purposes 2 naphthoate = 1 base = 1 *dihydrochloride*.

Each 13.2 mg. tablet of *primaquine diphosphate* contains 7.5 mg. base.

Each 100 mg. tablet of *proguanil monohydrochloride* contains 87 mg. base.

Pyrimethamine is prescribed in the form of base, *not* as a salt.

Antimalarial Drugs and Their Synonyms

Amodiaquine.—Cam-aqi, Camoquin, Flavoquine, Miaquin, SN 10751.

Chloroquine.—*Aralen, *Avloclor, **Nivaquine B, Resochin, Tanakan, SN 7618, 3377 RP.

Mepacrine.—Acriquine, Arichin, Atabrine, Atebrin, Atebrine, Chemiochin, Chinacrin, Crinodora, Erion, Haffkinine, Italchina,

*In parts of Africa this scale of dosage for proguanil has been found insufficient. In Nigeria, for example, the following scale has been recommended:

Adults: 100 to 200 mg. daily.

Children: 0 to 1 year, 50 mg. three to six times weekly; 1 to 3 years, 50 mg. daily; over 3 years, 100 mg. daily.

*Aralen and Avlochlor are *chloroquine diphosphate*.

**Nivaquine B, or Nivaquine, is *chloroquine sulphate*.

Maralicida, Methoquine, Metoquina, Metoquine, Palusan, Quinacrine.

Pamaquin.—Aminoquin, Beprochin, Fourneau-710, Gamefar, Pamaquine, Plasmochin, Plasmocide, Plasmoquine, Praequine, Quipenyl, Rhodoquine.

Proguanil.—Balusil, Bigumal, Chlorquanide, Chloriguane, Diguanyl, Guanatol, Paludrine, Palusil, Tirian, M 4888, SN 12837.

Primaquine.—SN 13272.

Pyrimethamine.—B-W 50-63, Daraprim, Malocide.

CHILD WELFARE AND SAFETY

ADDRESS BY MINISTER OF HEALTH

In opening the annual conference of the National Association for Maternal and Child Welfare in London on June 30 the Minister of Health, Mr. IAIN MACLEOD, spoke of recent progress affecting child health. Only a few years ago there were about 1,000 deaths every year from diphtheria, and notifications numbered 23,000; last year there were 24 deaths and 240 notifications. But it must still be constantly brought home to parents that safety for children lay in immunization. Smallpox had been banished, but opportunities for its importation were now greater owing to the volume of air travel. On the question of the use of B.C.G. in tuberculosis the Minister said that some people thought that his policy was too conservative. It was far from the desire of the Ministry to hold back anything as soon as it was satisfied of its value, but experience of a number of new drugs—he was not now speaking of B.C.G.—during the last 10 or 15 years had shown that while they were acclaimed on their discovery they were afterwards found to have unfortunate side-effects not apparent at first. On the whole it was well to walk a little delicately in this field.

To the local authorities, the Minister continued, was now handed the responsibility for the distribution of welfare foods. So much had been taken from local authorities that it was agreeable to hand something to them. This was a task which could be performed properly by local people rather than by a Government department. It would bring the recipients into the ordinary stream of maternal and child welfare provision. He was happy that local authorities should have agreed to the proposal, even though some misgivings had been expressed and in one or two cases there had been a noticeable lack of enthusiasm.

The Health Visitor

Health visitors, said Mr. Macleod, seemed to be in many ways the true link between the various services. It was through the health visitor, perhaps more than anyone else, that the hospital service, the general-practitioner service, and the services of the local authority could be brought together. He had been delighted to see this co-operation, which should be strengthened wherever possible. Perhaps the work of the health visitor could be made a little more selective—for example, in the visiting of families who were "below the line" for whatever reason. He had set up, in conjunction with the Minister of Education and the Secretary of State for Scotland, a Working Party on the functions of the health visitor, and he believed its report in due course would be of great value.

Attendance at ante- and post-natal clinics was decreasing, not necessarily because of the National Health Service. One of the reasons might be the increased tendency towards hospital confinements. He was advised with regard to hospital confinements that the figure to be aimed at was about 50% of the total births, but a higher figure in areas where social conditions were bad, and also that such facilities should be provided if necessary in the case of first confinements and of fourth and subsequent confinements. As for maternal and child welfare clinics, one of their most important functions was education in mothercraft. In their homely atmosphere directive training could be far better given than in the more formal surroundings of the out-patient department or the surgery of the busy doctor.

ORDER OF ST. JOHN OF JERUSALEM

The *London Gazette* has announced the following promotions in, and appointments to, the Venerable Order of the Hospital of St. John of Jerusalem:

As Knight: Dr. O. T. J. C. de H. Clayre. *As Commanders (Brothers):* Surgeon Rear-Admiral R. W. Mussen, C.B., C.B.E., M.D., F.R.C.P., Major J. R. Hamerton, T.D., M.B., R.A.M.C., Air Vice-Marshal R. H. Stanbridge, O.B.E., M.R.C.S., L.R.C.P., Drs. T. D. W. Fryer, E. R. Weaver-Adams, A. Byrne-Quinn, N. M. Maclennan, H. B. Pierce, G. P. Williams, and E. M. B. West, O.B.E. *As Commander (Sister):* Mrs. Mary A. C. Ainscow, M.B. *As Officers (Brothers):* Surgeon Captain A. A. Pomfret, O.B.E., M.B., Major-General W. A. D. Drummond, C.B., C.B.E., F.R.C.S., Colonel A. Meneces, C.B.E., D.S.O., M.D., M.R.C.P., Mr. D. A. Davies, F.R.C.S., Drs. T. K. Abbott, J. L. McKenzie-Brown, O.B.E., L. H. Wharton, M.B.E., P. E. Creswell, R. V. C. Richards, and P. W. Dill-Russell. *As Associate Officers (Brothers):* Drs. Yeo Choon Hooi and J. Shibko. *As Serving Brothers:* Surgeon Commander S. H. R. Price, M.B., R.N., Major G. E. B. Payne, M.D., Drs. G. J. N. de Fonseka, Lee Ching-Wa, Pang Hock Koo, C. Morgan, F. J. Boyd, A. F. Wilson-Gunn, W. Stephenson, B. A. Crook, G. Dougan, M.P., W. N. Jones, N. E. Williams, C. F. Fairlie, T.D., N. V. M. Dodds, P. J. Bennetts, G. Thompson, H. E. Hughes-Davies, T. Davies, A. Maddock-Jones, T. E. Watkins, C. H. Dawson, and R. K. Brooks. *As Associate Serving Brothers:* Drs. Ooi Phee Tuan and Loh Kwong Lam. *As Serving Sisters:* Miss Cheng Siu Yue, M.B., and Mrs. Frances E. Simpson, M.B.

Nova et Vetera

RECOLLECTIONS OF ALEXANDER WOOD

Dr. W. E. CARNEGIE DICKSON, of St. Margaret's-on-Thames, writes: There must now, I think, be comparatively few people still living who personally can remember the late Dr. Alexander Wood, inventor of the hypodermic or subcutaneous syringe, as do I myself and my eldest sister (*née* Miss Elizabeth Grant Dickson, now Mrs. Denis Robins). We both have a vivid recollection of visiting him at his home in the Royal Circus, Edinburgh, when we were small children, and seeing him lying on a couch with a plaid over his legs. In reply to a letter, my sister tells me that she can recall him as "an elderly man with side-whiskers. He was lame, and had an elderly housekeeper who didn't altogether appreciate visits from such juvenile guests." He offered us a choice of cake or shortbread, and my sister politely chose the former, while I said, "I would like a little bit of both, thank you." He was an intimate friend of my father's, the late Dr. George Dickson, of Edinburgh; and Dr. Wood used to send my sister and me beautiful satin-covered boxes of chocolates at Christmas-time. After my father's death I found among his papers the characteristic photograph of Dr. Wood reproduced here. Writing on the "Centenary of Hypodermic Injection" (*British Medical Journal*, November 28, 1953, p. 1180), Dr. G. A. Mogey said that "the Alexander Wood of hypodermic fame is often called Secundus to distinguish him from his grand-uncle, an earlier Dr. Alexander Wood (1725–1807), familiarly known as Lang Sandy," but we children always understood that term to apply to our "hypodermic" friend. His name occurs on page 35 of the *Edinburgh Academy Register*, published for the Edinburgh Academical Club by Messrs. T. & A. Constable, Edinburgh, in 1914; and in the list of his publications there occurs the item, "New Method of Treating Neuralgia by Subcutaneous Injection, 1855."

Dr. Alex. Wood

British Medical Association

ANNUAL MEETING, GLASGOW, 1954

SUMMARY OF PROCEEDINGS

FIRST PLENARY SESSION—"THE PROBLEM OF SLEEP"

The first of the three Plenary Sessions at the Glasgow Meeting was held in the Kelvin Hall on Tuesday morning, July 6, when the subject was "The Problem of Sleep." Sir DAVID CAMPBELL (Aberdeen) presided.

Applied Physiology of Sleep

Sir GEOFFREY JEFFERSON (Manchester) opened by remarking that in many respects sleep was still an unsolved physiological problem. A vast literature had accumulated on the subject, but many things remained obscure. For example, man was a night sleeper and a day waker, for the reason that he depended on vision for his doings, yet there was no inherent physiological necessity for sleeping at night and not in the day, and it was possible to train people to sleep at unusual hours. What happened during sleep? Most people thought that they slept without moving, but when the habits of a sleeper were observed it was found that he might make from 30 to 60 movements in the night. Indeed, immobility in sleep was a sign of pathological coma, and it was well recognized that unconscious patients who moved had a better prognosis than those who were motionless. There were no rules of behaviour in sleep. With many people the peak of unconsciousness was reached in one and a half hours or so, and this was followed by a lighter sleep which continued more or less uninterruptedly until daybreak. It had also been shown that mental functions did not reach their optimum until several hours after waking. "No one is at his best first thing in the morning." During sleep there occurred a fall in temperature, metabolism, blood pressure, respiratory rate, and blood oxygen; skin temperature rose, and various alterations took place in muscle tone.

The most tenable theory to explain sleep was that it was a conditioned reflex depending on fatigue of a waking centre rather than on stimulation of a sleep centre. Why did we wake up? The area of the brain controlling waking had now been assigned to the reticular formations of the brain stem and the basal ganglia. The fact that many people got refreshment during very short periods of sleep seemed to negative the hypothesis that sleep was due to the destruction of accumulated waste products. Man could not stay awake for ever, and it was possible that the disturbance of enzymes in the body made it difficult to stay awake. Certain sleep patterns had been demonstrated by electroencephalography, and the phases of cortical activity during sleep had been illustrated.

Applied Pharmacology

Professor D. M. DUNLOP (Edinburgh) mentioned the necessity of removing stimuli which might prevent sleep. These included cold feet, unduly chilly or stuffy bedrooms, an over-filled or an empty stomach, an overloaded bowel or over-distended bladder, pruritus, pain, and bodily discomfort of all kinds, and particularly the emotions of fear, anger, guilt, worry, or love. "Occasionally, of course, sleep may be favoured by sensory stimuli without evoking any emotion whatever, such as many wireless programmes, and the lucubrations of a large number of after-dinner speakers, lecturers, and readers of scientific papers."

A hypnotic, Professor Dunlop continued, was a drug which, in therapeutic doses, produced no permanent ill-effects in depressing the central nervous system, and allowed a wide margin between the dose needed to depress the higher centres and that producing depression of the medulla. The enormous increase in the use of hypnotics during recent years could be ascribed in part to our "stop and go" method of living. The average city dweller desired to turn consciousness on or off. "I don't know," a young woman was reported to have said, "whether to take a 'benzedrine' and go to the party, or to take a 'seconal' and go to bed."

The ideal hypnotic produced a reliable hypnotic effect, did not cause a preliminary stage of excitement, did not irritate the stomach, was absorbed readily from the intestine, was broken down and excreted rapidly, had no dangerous side-actions, had a wide margin between hypnosis and medullary depression, and did not produce tolerance or drug addiction. No hypnotic possessed all these virtues.

Chloral hydrate had stood the test of time as a safe and reliable hypnotic. An appropriately flavoured mixture of 1.2 g. (20 gr.) of chloral and 1 ml. (15 minims) of tincture of opium was the ideal prescription for the patient with pneumonia and for many cases of coronary thrombosis after the acme of the pain had subsided. The therapeutic action of a single dose of potassium bromide was no greater than that of a dose of salt water. When given continuously over long periods bromides had a strong sedative action, but the depression produced was insufficiently selective to induce sleep without causing undesirable drowsiness during the 24 hours. Chronic poisoning from prolonged administration of bromides was not uncommon. When their concentration in the blood reached 100 mg. per 100 ml., about 15% of the chlorides were replaced by bromides, and bromism might result when the concentration rose above this figure.

Paraldehyde was readily absorbed. Its actions were similar to those of alcohol, but its hypnotic effect was much more powerful and acted very promptly. Probably it had a larger margin of safety than any other sleep-producing drug, but it was horrible to take and gave an unpleasant odour to the breath. Barbiturates had a wide range of action. The following were the long-action barbiturates:

Official Preparation	Proprietary Names	Dose	Duration in Hours (approx.)
Phenobarbitone	Luminal Gardenal, Somonal	30–120 mg. (½–2 gr.)	12–24
Barbitone ..	Veronal	0·3–0·6 g. (5–10 gr.)	10–20
Sodium barbitone	Medinal, Embinal, Veronal Sodium	0·3–0·6 g. (5–10 gr.)	8–16

Phenobarbitone should never be used as a hypnotic. It was a long-acting sedative for use in anxiety and other states. For most patients the choice of a hypnotic might be made from the barbiturates of short or medium duration. Some artistry was necessary in the choice of the drug. When a business man required a hypnotic for a night journey from Glasgow to London, it was unwise to prescribe barbitone, which would not put him to sleep until he got to Carlisle, and he would not get rid of its ultimate effect until towards the end of his board meeting.

The barbiturates of short or medium duration were as follows:

Official Preparation	Proprietary Names	Dose	Duration in Hours (approx.)
Allobarbitone ..	Dial	100–200 mg. (1½–3 gr.)	8–10
Butobarbitone ..	Soneryl, Neonal	100–200 ,, (1½–3 ,,)	8–10
Amylobarbitone	Amytal	100–200 ,, (1½–3 ,,)	6–8
Pentobarbitone	Nembutal	100–200 ,, (1½–3 ,,)	6–8
Cyclobarbitone	Phanodorm	100–200 ,, (1½–3 ,,)	4–6
Quinalbarbitone	Seconal	100–200 ,, (1½–3 ,,)	4–6
Hexobarbitone	Cyclonal, Evipan	250–500 ,, (4–8 ,,)	3–4

When a patient had difficulty in falling asleep the short-acting drugs such as cyclo- or quinal-barbitone were suitable. When he complained of waking during the early hours of the morning the medium-acting drugs such as allo- or buto-barbitone might be more suitable. Professor Dunlop drew attention to the fact that most of the proprietaries were significantly more expensive than the official preparations, and suggested that it was high time doctors prescribed them in their official form. Barbiturates accounted for about 10% of all drugs prescribed. Barbiturate poisoning

was often suicidal, but sometimes accidental because the first dose might weaken the memory and the patient might obliviously go on taking the drug. The short-acting barbiturates should ideally be prescribed in lots of 12 tablets or capsules at a time.

Professor Dunlop said that on the traditional desert island he would take with him chloral laced with tincture of opium in case he got pneumonia; paraldehyde for intramuscular injection in case he suffered from delirium tremens; phenobarbitone for his anxiety neurosis; quinalbarbitone for ordinary night use; and butobarbitone for the ultimate early-morning wakefulness of old age.

The Problem as Seen by the General Practitioner

Dr. J. O. MCDONAGH (Stanley, Perthshire) said that the sleep problem which presented itself to the general practitioner was almost invariably insomnia, though the opposite condition, that of sleeping too much, was one that, with increasing interest in geriatrics, was becoming of more importance. The length of sleeping time was entirely individual. Some adults were quite fresh after four hours; others were dull after eight or ten. The elderly and senile were divided into two groups: those who slept badly and those who spent most of the remainder of their lives sleeping or dozing. No ill effects were apparent if sleep were taken in the day instead of in the night—many night workers expressed a preference for their mode of life—nor did it seem to matter if sleep was taken in divided doses, as on the marine watches. To read the advertisements one might suppose a certain mattress or pillow was required, yet half the earth's population slept on the hard earth or mats. Lack of sleep had become almost a fashionable complaint. To some extent it was due to the advertisement of sleeping aids. A man who had had a slightly bad night would have forgotten about it if he were not surrounded by advertisements reminding him that he had not slept well.

The speaker went on to discuss the acute and chronic conditions with which sleeplessness might be associated. The sleeplessness was largely secondary to the disease, but in a number of cases seemed to accentuate it, or might be so overriding as to obscure it. In some acute diseases it should be routine practice to prescribe a sleeping drug; if this were not done it was likely that the doctor would be called out in the night. In cardiac disease sleeplessness was a prominent and distressing symptom. Patients with aortic incompetence might be kept awake by the noise of their own heart beats, and those with high blood pressure by the sound of the blood pulsing in an artery.

"The study of sleeplessness is a study of human nature, and the story is often as complicated and tense as may be read in a story magazine. A little unravelling and explanation might work wonders and prevent the patient from starting drugs."

On the subject of night starvation and the beverages specially advertised for this, Dr. McDonagh declared that "best of all is a plate of good thick porridge." Tea, coffee, or alcohol, taken in the evening, or even in the afternoon, could keep a person awake. Things which helped sleep were a bath, a little reading, a chat over the day's affairs, the position taken up for sleep, the very act of snuffing out the light, and one must never underestimate the effect of prayer.

A General Medical Problem

Dr. A. H. DOUTHWAITE (London) discussed the environmental causes for the inability to sleep so common in middle age, and especially in women. These included disturbance by noise, in country as well as town. The snoring of a bedfellow was another cause of disturbance.

"It is usually the man who snores, but not always so. Men are invariably annoyed and disturbed by a wife's snoring. Women usually sleep through it, except at moments of extreme crescendo. A few complain bitterly, and it is our job to persuade the spouses that separate rooms do not necessarily mean any lessening of affection. The reason why women as a whole tolerate male snoring has been explained as due to gratification that the husband should make these prehistoric cave-dweller noises as an atavistic return to his role of keeping marauders away from his home."

There were many strange things about sleep. Many would remember how soundly they slept in the autumn of 1940—unless it happened to be a raid-free night, when they would be kept awake and enraged by the rattling of a door. A mother who could sleep through the noise of gunfire would wake instantly at the whimper of her baby.

Dr. Douthwaite went on to discuss bodily causes for lack of sleep, especially conditions of the alimentary tract. The large late meal, often of relatively indigestible food, disturbed all save the very young. A warning signal of relapse of duodenal ulceration was commonly the waking in the early hours, although no pain was experienced; this might go on for a week or ten days before nocturnal pain was felt. A loaded colon was probably more often the cause of sleeplessness than a distended stomach. An appreciable reduction of food intake was often followed by dramatic restoration of normal sleep. For immediate treatment belladonna was superior to the barbiturates.

As for drugs, the public was alive to the stimulating properties of coffee, but singularly ignorant of the similar action of tea. Of drugs commonly in use amphetamine, thyroid, and ephedrine deserved special mention. Alcohol, though inducing somnolence in most people, was usually followed by wakefulness in the early morning hours.

It was a less simple matter to deal with the victims of anxiety. Little could be done except prescribe drugs when the anxiety arose, as it often did, from marital infelicity. The insomnia which arose as the result of sheer hard work coupled with great worry and responsibility was only to be met by a long holiday, free from all contact with business.

"Drug-taking has been made too simple to be good, for it is easier to swallow a capsule than to wait patiently for sleep. . . . Perhaps the most important step is to explain how harmless insomnia really is. After all, we never sign certificates as death from insomnia. . . . The point to press home is the fact that insomnia does no harm. That is why an initial holiday is so helpful, because there is then no excuse that the patient must be alert for work next day."

The best of all remedial measures was the conscious relaxation of the muscles combined with deep breathing and banishment of active thought. This was better understood in the East than in the West, and deserved more attention than it had received in the past.

Sleep as a Neurological Problem

Dr. MACDONALD CRITCHLEY (London) said that the ebb and flow of consciousness had attracted little attention and was largely taken for granted even by medical men. Disproportionate attention had been paid to abnormal unconsciousness caused pharmacologically or by invasion of the nervous system. He confined himself to the "pre-dormitum" process of sleep. This varied greatly in individuals. Some, often those of a forceful and industrious nature, had virtually no stage of sleepening, as Gowers called it; others, usually of an anxious temperament, had a pre-dormitum of several hours. Strange illusions were sometimes experienced while awaiting sleep; these were normally of a sensory nature, and this stage could be curtailed by quick-acting barbiturates.

"The pre-dormitum can often be marred by unpleasant mental or physical phenomena. In the first place there is the condition of hypnagoguic motor restlessness, commonly affecting the legs below the knees. This is known by a variety of names and in a rare type is associated with pain. This condition can be relieved by adequate dosage of quick-acting barbiturates, but one disadvantage of this purely palliative action has already been stated, and the subject may also too readily discover the sedative virtues of alcohol. In other states the pre-dormital unrest symptoms are mental; there may be sudden panics causing even abrupt return to full wakefulness. On other occasions there may be halluci-

nations. The latter may occur in normal subjects, but are also common to narcolepsy."

Another set of symptoms arising in the pre-dormitum were abrupt sensory and motor phenomena, taking the form of sudden bangs or flashings localized in the skull, or more commonly violent motor starts associated with myoclonic jerks of all degrees, frequency, and duration.

SECOND PLENARY SESSION: FOOD AND DISEASE

Wednesday, July 7

At the second plenary session the subject of discussion was "Food and Disease," and the chair was taken by Dr. W. G. CLARK (Edinburgh).

General and Administrative Aspects

Dr. C. METCALFE BROWN (Manchester), speaking of food-poisoning outbreaks, said that an authoritative American textbook had included a chapter entitled "Food Injuries and their Prevention." "Injuries" they certainly were. Most of them were regarded as accidental, nearly all of them were the result of carelessness or ignorance, and all were lethal or potentially so, while at the same time almost all, or perhaps all, were preventable. There was a lack of understanding of the nature and dangers of food-poisoning among the general public, and indeed an anonymous writer in a medical journal had asserted recently that "food-poisoning is not a permanent cause of human misery or disability."

The salmonella group of organisms had been shown to be responsible for many sporadic cases and incidents of poisoning. Most cases of food-poisoning of bacterial origin were the result of infection from hand to mouth, and the mouth was not necessarily that of the owner of the hand. The ideal standard of cleanliness in food-handlers would be the same as that of surgical cleanliness. This was too much to hope for, but the nearer they got to that standard the fewer would be the outbreaks of food-poisoning. Such a plenary session as the present would be unnecessary if everyone would thoroughly wash his hands immediately after visiting the toilet. They had been far too modest about impressing upon people the necessity for this precaution.

Approximately 6,000 cases of food-poisoning were reported each year in England and Wales, and there was evidence that at least 11,000 persons were affected annually. The number of deaths from food-poisoning in the period 1951–2 was 69.

The education of the public was a major concern, and here the general practitioner had an important function. He had unrivalled opportunities for educating the families in his care. The need for early notification of food-poisoning cases and the necessity of preserving the samples of relevant material for laboratory examination should be emphasized. Food-poisoning was a challenge to the catering trade and to all members of the medical profession.

Classification of Food-borne Diseases

Dr. JOAN TAYLOR (London) said that food-borne diseases might be due to infective agents which caused disease in animals or in man. Among the parasitic diseases of animals, infestation with *Trichinella spiralis* was the most important in this country as a cause of disease in man. Brucellosis and tuberculosis caused by the bovine bacillus were also animal diseases. There were some diseases of man in which food played an entirely passive part, being the means by which the organism was transferred from one patient to another. An example was typhoid fever, in which water or food conveyed the bacillus from one patient to another. The most important food-borne diseases were those due to organisms which affected the intestinal tract of man. These could be classified as (1) food-borne diseases such as typhoid fever and sometimes dysentery; and (2) food-poisoning due to (*a*) organisms of the salmonella group, (*b*) bacterial products containing a toxin, of which the staphylococcal toxin was the best known, and (*c*) a miscellaneous group, in which were included chemicals and various poisonous fungi.

The incidence of typhoid fever showed practically no seasonal variation in this country, whereas food-poisoning due to other salmonella organisms showed a marked increase during the summer months. The incidence of paratyphoid fever also had a seasonal variation. The incidence of Sonne dysentery differed from these infections in that there was a marked rise in the winter months.

Dr. Taylor then showed a table giving the types of food most likely to cause food-poisoning. These were made-up meat dishes and foods which were lightly cooked and then kept in conditions suitable for bacterial multiplication. The incubation periods and main symptoms of bacterial food-poisoning were as follows:

	Toxin Type		Infection Type
	Staphylococcal	*Cl. welchii*	Salmonella
Incubation	2–4 hrs.	12–16 hrs.	24–36 hrs.
Vomiting ..	Extremely common	Very rare	Common
Diarrhoea ..	Common	Extremely common	Very common
Pyrexia ..	Absent	Absent	,, ,,
Prostration	Common	,,	Rare in early stages
Duration ..	1 day (about)	2 days (about)	2–8 days

An analysis of 173 food-poisoning incidents in which meat was the presumed vehicle showed that in 145 of the cases the meat had been processed. Of these 145 cases the causal agent was staphylococcal in 67, *Cl. welchii* in 30, and salmonella in 48. Dr. Taylor also referred to the number of cases of food-poisoning in which duck eggs were the presumed vehicle. Of 294 outbreaks due to *Salmonella typhi-murium*, duck eggs were the presumed vehicle in 94 (32%).

The incidence of salmonella infections was higher in the very young and in the elderly. For the years 1949–52 the incidence was as follows:

Age in Years	*Number of Cases*
Up to 9	614
10–19	120
20–59	104–107
60–69	58
70 plus	52

Thus practically half the salmonella infections occurred in young children. Of children under 1 year of age who were affected only 9% had a short illness (up to three days), whereas 37% had a long illness (14 days plus). Again, among people over 70 only 7% had a three-day illness or less, and 32% an illness of 14 days or over. Early diagnosis would assist both in the treatment of the patient and in the prevention of spread.

Sources and Spread of Infection

Brigadier J. S. K. BOYD (London) said that, although animal sources of infection were less important than human reservoirs, they must be mentioned for the sake of completeness. Tapeworms and certain flukes were acquired by eating the flesh of the animal host. Infection with *Trichinella spiralis* might result from eating undercooked sausages containing infected pork. Undulant fever and bovine tuberculosis were conveyed by milk. Salmonella infections could be contracted from food contaminated by rats or mice or from infected duck eggs.

In practice the human reservoirs of infection were the most important. Infection might spread direct from soiled hands or indirectly by flies. Gastro-enteritis might be caused by the staphylococcus toxin in food, often ice-cream, contaminated by particles from the nasopharynx of the carrier. This toxin was relatively heat-resistant and might remain active after the bacteria had been killed by cooking. In such cases bacteriological examination of specimens from the patient would yield negative results. It was usually easy, however, to culture the staphylococcus from the infected food.

In tracing the source of food-poisoning caused by coliform bacteria, identification of the pathogenic organism

was facilitated by improved modern techniques, and particularly by phage-typing, which narrowed the field of investigation and could on occasion lead direct to the individual carrier.

The success of bacterial investigations depended to a large extent on the care with which specimens were collected by the general practitioner. Positive results were more likely to be obtained from actual portions of the suspected food, however small, and from specimens of excreta taken early in the course of the disease.

Brigadier Boyd concluded by saying that no matter how efficient the laboratory or careful the technique, laboratory tests would be of no avail unless correct specimens were obtainable—specimens from the suspected food and specimens taken from human cases in the early stages of the disease—and this could be done only by the general practitioner. There was a very strong need for a twentieth-century sanitary awakening to ensure proper standards of personal hygiene. Education must be directed to all who handled food, whether consumers or preparers at any stage. Besides special courses for those employed in the food industry, there should be adequate basic instruction right through the school curriculum and in adult education afterwards. A great deal of such teaching must be done by doctors, and they would be rewarded by a fall in the number of their patients needing treatment.

Prevention of Food-borne Infections

Professor R. CRUICKSHANK (London) said that in these days of purified water supplies, pasteurized milk, and piped sewage the means of control and prevention of food-borne infections must be sought in the education of the public in a high standard of personal cleanliness. This task was one for team-work affecting all concerned in the Health Service, especially the general practitioner and the medical officer of health and his ancillary workers. In addition, every family should have the basic requirements for the improvement of its household hygiene—running hot water, water closets, and refrigerators.

With the disappearance of domestic labour everybody in the household was now a food-handler and shared in household chores. This made it all the more essential that all should adopt a rigid code of hygiene. He put forward the following special points for consideration: (1) there should be a hand-washing routine after visiting the lavatory; (2) cleanliness of handkerchiefs, hands, nails, and hair (and avoidance of unguarded coughs and sneezes); (3) banishment of the communal towel; (4) recognition of the dangers of minor intestinal upsets among persons dealing with food; and (5) proper attention to minor skin lesions to prevent sepsis developing. The number of persons actually handling food should be reduced to the minimum.

The main dangers were to be found in cooked meats, gravies, milk foods, salads, and duck eggs. Long intervals between cooking and consumption of food should be avoided. "Left-overs" should be always recooked. When prepared food could not be recooked it should be stored in a refrigerator. Risks of contamination from dust, vermin, and especially from house-flies should be eliminated by covering the food. Duck eggs should be restricted to use in cooking—that is to say, in cakes, etc.—or they should be hard-boiled. They should not be scrambled or made into omelettes. All these precautions should be specially observed in hot weather.

Professor Cruickshank added some points about food utensils. Washing-up should consist in (1) cleansing off food remains; (2) rinsing with really hot water to remove dirt and detergents; (3) drying without wiping (a boon to the lazy husband); and (4) storing in a closed cupboard. Large cooking utensils could be particularly dangerous in infecting food during transit from a central kitchen to a school. These dishes should after cleaning be sterilized with chemical disinfectants or steam. Special consideration should be given to infants' feeding-bottles and teats: it was essential that these should be cleansed with hot detergents and rinsed and sterilized before use.

The Catering Aspect

Mr. A. E. BURDETT, managing director of a catering firm and vice-president of the Caterers Association, said a word in defence of the commercial caterer. He thought that the danger of food-poisoning had been exaggerated. It was well to keep a sense of proportion in this matter if the population were not to be neurotics and hypochondriacs. Instead of describing as "food-poisoning" the results of eating food not hygienically handled or prepared, it would be fairer to speak of "sickness and minor disposition." The recorded cases of food-poisoning during the first 10 months of 1953 were just under 6,000, and of these 940 arose from commercial establishments, 3,760 from non-commercial establishments, 1,400 from the home, and 900 were not detailed. This seemed to put the matter in the right perspective. Some of the remarks of Dr. Metcalfe Brown and Professor Cruickshank were a counsel of perfection. What was medically necessary was too often confused with what was aesthetically desirable. The catering industry accepted the statement of Dr. Charles Hill, Parliamentary Secretary to the Ministry of Food, "There is a problem here, but it is a small problem." The considerable efforts of the catering industry should be borne in mind. The Catering Division of the British Tourist and Holiday Board had stimulated and developed the washing of hands and also the rinsing of utensils, etc., in hot water when washing up. The Clean Food Guilds could also be of great help in educating the public and all food-handlers in the importance of hygiene. In addition, the Hotel and Catering Institute, set up in 1950, gave great emphasis to the importance of hygiene in all its teaching. He thought there was a danger that the regulations to be made under the new Food and Drugs Act might be out of proportion to the size of the problem. It was most desirable that there should be an examination of the new regulations by an objective body like the Catering Trades Working Party, consisting of Government, medical, scientific, and industrial representatives, with a view to the still further reduction of the small incidence of food-poisoning cases.

Nutrition and the "Sophistication" of Foods

Professor B. S. PLATT (London) referred to some recent developments in the chemical manipulation or sophistication of foods and the relation of these to present-day feeding habits. Sophistication took various forms—the addition of synthetic nutrients to foodstuffs (such as the fortification of wheat flour), and the addition of food concentrates (for example, fish-liver oil to margarine). Substances were also introduced into foods to produce uniformity of certain qualities of food products in order to satisfy consumer demand: these included preservatives, anti-staling agents, and colouring and sweetening matter. Another group of additives were accidental contaminants, derived possibly from packaging materials or from cleansing operations (such as the use of detergents). The main unintentional additives were residues from toxic chemicals used in agriculture—for example, insecticides, fungicides, and herbicides. These chemicals included over 100 substances, many of which were among the most powerful poisons known. The onus of assessing the hazards of these substances on the health of the consumer must be laid squarely on the shoulders of the medical profession, which should lose no opportunity to obtain, scrutinize, and weigh the evidence before countenancing existing practices or sanctioning new developments in this field.

Possible Dangers of Artificial Feeding of Infants

Professor Platt then turned to a different subject—the artificial feeding of infants. Formerly, he said, breast-feeding by the mother was almost universal in this country, and such feeding might continue for two or even three or more years, but nowadays the child was often artificially fed from its earliest days or weaned from the breast at 6 or 9 months. Until recently there had been no very convincing evidence for the superiority of mother's milk over

cow's milk, but some observations he had made had led him to speculate about the possibility that modern infant feeding might be concerned in the causation of certain diseases associated with modern conditions of life for which there had as yet been no satisfactory explanation. On the basis of some animal experiments he had wondered whether the mother during lactation should be regarded not merely as the provider of food but as a supplier of substances ready made for use by the infant until such time as he could synthesize them for himself. Was breast-feeding a device by which provision was made for the transition between complete dependence on the mother before birth and complete independence after weaning? An infant fed on cow's milk stored nitrogen at a much greater rate than one fed on breast milk. Presumably much of this nitrogen was stored as muscle protein, and it might be inferred that with infant feeding on cow's milk the rate of muscle development was more rapid than in the breast-fed infant. If this entailed more rapid myelination of the appropriate nerve supplies, and if the galactose for the synthesis of myelin must come ready synthesized from the food, the fact had to be reckoned with that the baby fed on cow's milk perhaps got only two-thirds the amount of lactose which he would receive if he were being fed on the corresponding amount of human breast milk.

Professor Platt contented himself with raising the question whether this possible extra demand, coupled with the reduced supply of galactose, had any adverse effect on the subsequent health of the individual. The sequelae of the biochemical disturbances might not be manifest, clinically or pathologically, for many years. It was possible that the ill effects of artificial feeding of infants might not be seen until after the tissues had been exposed to stress or the effect of noxious agents. They might be reaping in the post-mortem room to-day the results of methods of infant feeding which were prevalent 20 or 30 years ago. He had in mind the possible connexion between this circumstance and the occurrence of disseminated sclerosis. The connexion between the amount of galactose in the infant's diet and the nature of the connective tissue laid down in early life might also be investigated in relation to the occurrence of what were now sometimes called the collagen diseases.

Notification of Food-poisoning

Only one question was asked of the panel. It concerned the principle which general practitioners should follow in notifying cases of food-poisoning. Dr. METCALFE BROWN replied that cases of sickness and/or diarrhoea must be so common in medical practice that those which were notified could form only a very small minority. Obviously the family doctor would not notify an odd case of diarrhoea, but where he came across a case in which the cause appeared to be infected food or found a number of similar cases in a household or locality he should certainly notify. There must be very few in any gathering who could truthfully say that they had never had an attack of food-poisoning. The number was far greater than the number notified.

The CHAIRMAN then asked those present in the meeting who had never at any time in their lives suffered from food-poisoning to hold up their hands, but no hand was held up. In closing the session he said that they were surely moving towards a more hygienic handling of foodstuffs.

THIRD PLENARY SESSION: PULMONARY TUBERCULOSIS

Thursday, July 8

The third of the Plenary Sessions was devoted to the problem of pulmonary tuberculosis to-day.

Sir ANDREW DAVIDSON (Edinburgh), who presided, said that in spite of advances in many directions far more knowledge was needed concerning the social and biological aspects of tuberculosis before the main objective of control could be achieved. The fall in mortality brought about by recent improvements in medical and surgical treatment had not been matched by a drop in the number of new cases discovered. For this reason attention must be focused on prevention. Effective preventive treatment should be directed along the following lines:

(1) Strengthening of resistance through improvement of environmental conditions;
(2) Encouragement of medical, social, and biological research;
(3) Efficient case-finding with early diagnosis and isolation of potential sources of infection;
(4) Early and effective treatment;
(5) Search for sources of infection and supervision of contacts;
(6) Rehabilitation and resettlement.

Important factors in such a scheme also were protective vaccination and the education of the public. The problem went far beyond the ordinary scope of medicine.

The Problem in Figures

Dr. PETER MCKINLAY (Edinburgh) said that the death rate from respiratory tuberculosis in Scotland in 1950–2 was 37 per 100,000 population, and deaths from this disease were 3% of the total deaths registered. The corresponding figures for England and Wales were 28 and 2.28% respectively. In Scotland the mortality rate for males was about 50% higher than for females. The rates were comparatively low in children, reaching a minimum at 10–15 years. They then increased and reached a maximum for women at ages 25–34 and for men at 55–64. Mortality was highest in the industrial west, particularly in the large burghs, and lowest in the north-east. In 1952 1.52 new cases were reported in Scotland per 1,000 population, the male rate being 15% heavier than the female. The death rate from respiratory tuberculosis had been declining before the outbreak of the last war, but it rose in 1940 and remained high until 1948. Since then it had fallen dramatically. The rates for 1952–3 were a record low level for Scotland and below what they would have been had the pre-war downward trend continued at the same rate. Even so they were unsatisfactory compared with those for countries in Northern Europe. The combination of a declining death rate with a higher notification rate had led to an increase in the number of registered cases since early in the war. In 1931 this figure was 4.4 per 1,000 population; in 1938 it was 3.5, and it increased to 6.0 in 1948 and 7.8 in 1952.

Preventive Aspects

Professor A. B. SEMPLE (Liverpool) declared the prevention of pulmonary tuberculosis to be one of the chief tasks facing British medicine. A rapid fall in the death rate owing to the great advances in therapy had not been accompanied by a comparable reduction in the number of fresh cases as measured by notifications. The reservoir of infection in the community was not reduced as much by modern therapy as might be expected, and there were more cases of tuberculosis in the community than was generally realized.

The speaker went on to make a plea for the notification of all cases of tuberculosis, especially by hospitals. Notification was the mechanism which released the preventive services of the local health authority, and it was on the completeness of such notification that success in the control of tuberculosis largely depended. The medical officer of health must ensure that his scheme for the control of tuberculosis permitted adequate scope for consultation and collaboration among all concerned with the health and welfare of the patients—the chest physician, the general practitioner, the tuberculosis health visitor, and others. More medical and epidemiological interest in tuberculosis was required in many health departments. Too many control schemes had tended to become static, especially since the inauguration of the National Health Service.

The aim of the preventive service should be to discover every infected person, to attempt to find the source of infection, to ensure adequate examination of contacts, and to bring to bear any preventive measures required as a result of a thorough epidemiological investigation. It was im-

portant to educate the patient: the individual effort of an informed person would do more for his own health and that of his family than anything which was done for him.

Pulmonary tuberculosis, said Professor Semple, was a home disease, not a hospital disease. In Liverpool for every case in hospital there were six cases at home, and approximately one-half of those home cases were in an infectious state. The dichotomy of the tuberculosis service under the N.H.S. had undoubtedly delayed the progress of prevention, but the time was now at hand for local tuberculosis authorities to consider their full responsibilities in this respect. Every local authority should put into operation the contents of the recent Ministry of Health memorandum on the subject. The requirements for prevention of the spread of tuberculous infection had been known for the last half-century. Every case of tuberculosis should be thoroughly investigated and the source of infection found. Success depended on completeness of investigation. Paediatricians often failed to notify cases of children with primary lesions because of a certain stigma which they felt might be brought upon the family. This was not in the best interest of the patient or of his parents.

Notification was the instrument of control, but too often it was a mere card filed in a drawer. The time was opportune for extensive tuberculin-testing at regular intervals of children attending schools. The great danger was the open case, spreading the disease in the family and among contacts.

The General Practitioner's Point of View

Dr. J. R. LANGMUIR (Glasgow) described the essential role of the general practitioner in this field as that of the case-finder. The general practitioner was particularly suited for this by reason of his training and experience, which in Glasgow and the industrial area of south-west Scotland must be considerable. This task would remain with the general practitioner until the ideal of universal serial *x*-ray investigation had been achieved.

A careful general practitioner should be able to refer patients for *x*-ray examination on the slightest suspicion. Therefore it was necessary that such a service should be expeditious, sparing the patient a protracted and unnecessary period of anxiety. Skin-testing had considerable value, especially in children under 5, and should be done more frequently.

An essential member of the team working under the medical officer of health was the tuberculosis health visitor. Her main task was to trace contacts. There was need for close contact and understanding between the general practitioner and the health visitor in their complementary roles. In order to control infection improvement was necessary in the arrangements for domiciliary consultations and for prompt admission to hospital.

It was the general practitioner who saw the patient at all stages of his disease and of his treatment. He should be given more information about his patients by other members of the team and more support in the policy of complete bed rest in the early case. He should also be told, when his patient was in hospital, of any change in treatment.

The general practitioner also had need to watch out for many conditions which, if neglected, were notorious precursors of tuberculosis. Yet again, it was he who could be the main counsellor of the patient, able to explain the disease and its treatment, and to ensure the patient's co-operation. Dr. Langmuir considered it not inappropriate to suggest that the present tripartite control of medical services tended to inefficiency by reason of overlapping and division of responsibility.

Medical Approach to Treatment

Dr. W. D. W. BROOKS (London) said that there had been a dramatic fall in tuberculosis mortality rates with but minor improvement in notification. This was true of both this country and the United States. The reason was probably that improved therapy arrested the disease in many persons and prolonged life among those suffering from the advanced disease. The main advance over other therapeutic regimes had been the introduction of prolonged courses of antibiotics and chemotherapeutic substances, such as streptomycin with P.A.S. Combinations such as this had been of special value in overcoming the disadvantage of bacterial resistance. A number of new antibiotics and chemotherapeutic agents had been developed which could in their turn replace the older products if the bacilli established resistance to them. The most valuable of these drugs seemed to be viomycin, thiosemicarbazone, and iproniazid. The risk of toxic reactions on occasion was still present, but desensitization, or treatment with A.C.T.H. or antihistamines, or a change to another drug combination offered a wide range of alternatives for the solution of the problem. In common with all types of therapy the best results of long-term chemotherapy were found in the younger patient and in those in whom the disease was early and less extensive.

Dr. Brooks drew special attention to the use of streptomycin and allied drugs in domiciliary practice without proper clinical, bacteriological, or radiological control. The extent to which this took place was not known, but it was probably considerable. If used intelligently these drugs achieved results never obtained before in the treatment of this disease, but without proper control they could be dangerous. All this pointed to the need for a full integration of the tuberculosis services of hospitals, sanatoriums, and chest clinics with those of the general practitioner in order to produce a safe plan for the domiciliary application of modern therapy.

Large-scale statistical researches had lately been developed. Such researches undoubtedly advanced medical knowledge rapidly, but they excluded all save purely scientific considerations, and the moral obligations of the doctor to the patient must come first. It was rare now for a hospital patient receiving any of the accepted routine measures not to have the benefit of concurrent chemotherapy. In an era of specific therapy it was essential to re-examine and re-estimate the value of certain procedures such as rest, pneumothorax, phrenic paralysis, resection, and so forth, and to give them their right place in the modern plan of treatment. These were outstanding problems of urgency.

"Such are the aspects of the treatment of pulmonary tuberculosis to-day which seem important to a physician. The fundamental basic principles of treatment remain unchanged. These are (1) the assurance that everything bearing upon the case is known before a plan of treatment is decided; (2) the accurate choice of the particular form of treatment best suited to each patient; and (3) the careful skill with which it is applied."

The Surgical Approach

Mr. T. HOLMES SELLORS (London) said that in recent years the two things which had affected them most in connexion with this subject were the introduction of antibiotics and the introduction of resection as a method of treatment. He compared the role of a surgeon to that of a demolition squad functioning after a conflagration and rendering affected areas safe by removal of damaged structures. The surgical approach had been greatly altered by the coming of antibiotics and the changing character of the disease, and now resections were performed as often as collapse operations. At one time the classical case for surgery was an apical cavity with a minimum of infiltration on the opposite side; to-day solid lesions, without cavitation, were more commonly encountered. All surgeons would agree that operation was but one stage in a general scheme of treatment.

Another tendency, the meticulous examination of the sputum, had led to frequent surgical intervention on slender grounds, often with unjustifiable loss of functional lung tissue. In each doubtful case the circumstances must be carefully weighed up and the decision reached in consultation between all the members of the medical team. It was an individual that was under treatment, not a radiograph or a laboratory report.

Mr. Sellors discussed the three principal operations—thoracoplasty and plombage (both collapse measures), and

excision. The first had stood the test of time and compared well with resection. It had the disadvantage that it was a two-stage operation, and patients feared the possibility of deformity. Resection of the lung should be reserved for cases in which collapse had not succeeded or seemed doomed to fail. The main indications were persistent cavities, severe bronchial stenosis, or gross destruction of lung tissue. When a lung was resected it was often advisable to perform a limited thoracoplasty to prevent over-expansion of the remaining lung tissue. Mr. Sellors showed *x*-ray photographs illustrating the conditions of which he spoke, and also gave some figures. In some 500 cases in which thoracoplasty had been carried out the mortality had been 2% and the complications 4%; and in resections, in 286 cases, the mortality had been 7% and the complications 14%.

In the future development of surgery in pulmonary tuberculosis it would be necessary to assess more fully the chances of natural healing with rest and antibiotic therapy alone in small and medium lesions. There would probably be a decrease in the amount of surgery performed in such lesions, though ample scope would be left to the surgeon in more extensive cases.

Rehabilitation and Resettlement

Dr. R. R. TRAIL (London) said that approximately 65,000 patients were discharged every year from sanatoriums in Great Britain; thousands more were treated at local clinics and in their own homes. It was a fair estimate that from a quarter to a third of them were left with some disablement, temporary or permanent, at the end of treatment. The Ministry of Labour, in April, 1953, gave the number of tuberculous disabled as 53,141; and, unfortunately, large numbers did not register.

Few ex-patients required no readjustment of their mode of life. Not all with converted sputum could be relied upon to remain sputum-negative, and it required more than normal courage on the part of the chest physician to advise those with positive sputum to return to open industry.

The only proved method of assessing a patient's ability to work was to let him try it under strict medical and industrial observation. There could be no comparison with the problem of the patient with an orthopaedic disability, where loss of function might be great, but was static and capable of early and final summation. Pulmonary tuberculosis was a variable disease and puzzling in its prognosis, and the time factor was of more weight than the *x*-ray findings, sputum tests, and sedimentation rates. It was also a very individual disease in its psychological factors.

"This country, through the Disabled Persons Employment Act of 1944, provides more facilities for all forms of rehabilitation than any other country in Western Europe or North America. If these facilities are still limited for the tuberculous this is not entirely the fault of the Ministry of Labour. The demand for extension must come from the chest services, backed by local authorities conscious of their responsibilities and opportunities in aftercare under Section 28 of the National Health Services Act."

As matters stood, admission could now be arranged to 3 village settlements or to 14 industrial rehabilitation units and 16 vocational training centres. In addition there were 90 Remploy factories (of which seven accepted infectious cases) and 32 sheltered workshops, of which 3 were for the tuberculous only.

Everyone, said Dr. Trail, was biased by his personal experience. He admitted his own bias towards rehabilitation, combined with ambulant treatment, which led up to vocational training and so to self-support through return to open industry or colonization in a settlement. That was possible through the scheme now in operation at Papworth and Enham-Alamein Village Settlements. There was no direct subsidization of labour. The 38 years' experience of Papworth had shown that the man or woman able to be up all day and to take one hour's walking exercise was usually fit to undertake such limited work, provided it was of a sedentary nature.

Rehabilitation should not be confused with vocational training for new occupations. A majority of those who entered this scheme went back to their former employment. Those who were considered to require continued observation and sheltered employment were advised to seek settlement, and some 17% of the total did so.

If settlement did nothing whatever for the beneficiaries themselves it would still be worth while for the results that had been obtained in the remarkable after-histories of their children. These histories were far superior to those of children of known tuberculous parentage living in unsheltered conditions. This result was due to many factors: these included the security afforded to the father in his occupation; adequate food, clothing, and accommodation; education of parents and children in hygiene directed towards the prevention of gross infection; the possible beneficial effect of continued exposure to minimal infections; and the continuous watch on the general health of the settler and his family. To separate these factors and say how much of the result was attributable to one or the other would be quite impossible.

Dr. A. R. SOUTHWOOD (South Australia) briefly described the tuberculosis problem in his State, where the mortality and morbidity figures were exceptionally good. In Australia as a whole the death rate had fallen to 20 per 100,000 of the population in 1950. In South Australia, with a population of 800,000, the death rate had fallen to the astonishingly low figure of 6.3 in 1953—a figure which Dr. Southwood thought might prove to be the lowest in the world. The notifications of pulmonary tuberculosis, however, had not fallen so dramatically, the figures for the years 1950–3 being 342, 350, 385, and 365 respectively. Improvement was being achieved by close attention to the economic problems of the tuberculous, by striving to diagnose the disease in its early stages, by tracing contacts, and by publicity measures. Skin testing was carried out on schoolchildren and on Army recruits, and B.C.G. was offered when skin tests were negative.

Questions

A limited time was available for questions from the audience. In reply to one question, Professor SEMPLE said that too much mass radiography was done *in vacuo*. The procedure called for close supervision. There was need for more education and case-watching in the home. Asked what was the optimum number of tuberculosis beds for any given population, he replied that he did not think there was any optimum. The only way in which they could judge a thing like that was by the waiting-list. The importance of isolation must not be forgotten: there must be enough beds to isolate the infectious case.

On the question of tuberculosis officers and health visitors encroaching upon the general practitioner's responsibility, he said that in Liverpool special efforts were made to bring general practitioners and health visitors together, so that they got to know one another and to understand each other's problems.

Dr. BROOKS was asked why no mention had been made of cod-liver oil and of the usefulness of vitamins in treating tuberculosis. He replied that if there was evidence of insufficiency of vitamin intake, the giving of vitamins would be helpful in treatment, but he knew of no evidence that vitamins, over and above the nutritional requirements of the individual, did any good whatever. In reply to another question he said that he considered there was a strong case for antibiotic therapy or chemotherapy when there was radiological evidence of a primary lesion.

Summing-up

Sir ANDREW DAVIDSON, in some remarks from the chair, said that the discussion had shown that there was reason for cautious optimism in the treatment of tuberculosis. The outlook had never been brighter. But the continuous fall in mortality had not been accompanied by a comparable reduction in the number of notified cases. In consequence of this disparity and of the greater longevity of the tuberculous, thanks to improved treatment, the reservoir of infection remained a troublesome problem. A warning had been

sounded about the domiciliary treatment of tuberculosis by the new drugs without clinical, bacteriological, or radiological control. A warning should also be given against the use of drugs until their value had been scientifically established. "In scientific research it is unwise to shout half-time scores."

It had also been brought out that there was need for the closest co-operation and understanding between all concerned in the control of tuberculosis, both in hospital and in the home—that is to say, the physician, the surgeon, the medical officer of health, the general practitioner, and the health visitor. It had been suggested that the tripartite administration of tuberculosis services encouraged lack of co-operation. Nevertheless, the organization of such services in this country would bear comparison with anywhere else.

The rehabilitation and resettlement of tuberculous persons were important tasks of society. It was satisfactory to note that more facilities existed in this country than in any other. There remained much yet to be done in educating the people —and these included the patients—in methods of tuberculosis control.

THE SECTIONS

SECTION OF MEDICINE

Wednesday, July 7

Care of the Elderly in General Practice

With the president, Dr. G. E. BEAUMONT (London), in the chair, Dr. TREVOR H. HOWELL (London) opened a discussion on the management of elderly patients in general practice. With the increasing number of old people in the community, about half of the family doctor's work now consisted in the care of elderly people with chronic disease. Resident appointments in general hospitals did not give the practitioner a proper training for dealing with old people, and the young practitioner often found it difficult when confronted with patients with unusual symptoms who were reluctant to be examined, who required only symptomatic treatment, and whose clinical condition was overshadowed by social problems. Cerebral thrombosis and the effects of senility were the commonest medical causes of old people being referred to hospital, other reasons being heart failure, incontinence, bronchitis, neoplasms, and rheumatic diseases. Admission to hospital was more often required for social reasons. It was vital for the practitioner to assess the prognosis in each patient as soon as possible. Hospital aid should be sought early and not as a last resort. Patients with hemiplegia, incontinence, or rheumatic complaints were best treated at home, but active and enthusiastic treatment was needed. Peripheral vascular diseases were best treated in hospital. Chlorpromazine was a valuable drug in geriatric practice: it relieved pain and restlessness, and controlled vomiting better than other drugs.

Respiratory Infections

Dr. NEVILLE C. OSWALD (London) said that bronchitis was a common cause of sickness and death in old people. Pathologically it was a chronic disease characterized by scattered bronchiolar inflammation leading to scarring, collapse, and emphysema in the pulmonary lobules. Wet or foggy climate and atmospheric pollution were common predisposing factors. Curative treatment should first aim at combating bronchial infection, which was most often produced by the pneumococcus and *Haemophilus influenzae*. Terramycin was probably the most useful drug in long-term treatment. It was hoped that good results would be achieved by autogenous vaccines. About half the patients benefited from antispasmodics. Inhalations of aerosol trypsin and detergents were not effective. Cortisone and A.C.T.H. sometimes helped, but were of limited value. Physiotherapy, although of undoubted use, was less effective after the age of 50.

Dr. T. MCEWAN (Glasgow) found that breathing exercises were of the greatest value in treating bronchitis. The most important aim of physiotherapy in this condition was not increased chest expansion, but relaxation. General thoracic relaxation should be taught, and at the same time movements of the upper half of the chest should be restricted while lower costal expansion and diaphragmatic movements were encouraged. The principles of treatment must be clearly explained to the patient, whose full interest and co-operation were essential to success. Mephenesin had been found a useful drug in helping patients to relax. Antibiotics were probably best used during acute exacerbations of the disease.

Parkinsonism

Dr. H. G. GARLAND (Leeds) discussed the diagnosis and aetiology of Parkinsonism. Although there was no curative treatment early diagnosis was important. Tremor was not an early diagnostic feature and was absent in about one-third of patients. Slowly progressive disability in a single limb often led to a faulty diagnosis. In such cases the patient was often referred to a psychiatrist or subjected to unpleasant investigations on the basis of a possible cerebral neoplasm. Rigidity was the earliest sign and was first detected in the neck: the patient would sometimes lie on a couch with his head unsupported by a pillow. Certain eye signs were almost constant and often pathognomonic. Persistent blinking in response to glabellar tapping was a most reliable sign and contrasted with the infrequent spontaneous blinking found in these patients. Parkinsonism was about as common a disease as disseminated sclerosis. Most cases belonged to the so-called "idiopathic" group. Less than one-third were due to previous encephalitis, and very few were caused by arteriosclerosis, syphilis, or trauma.

Dr. H. G. MILLER (Newcastle-upon-Tyne) said that treatment of Parkinsonism was most unsatisfactory. Treatment was palliative and the aim should be to treat the patient rather than the disease. Surgery had proved disappointing: it was applicable only to young patients with non-progressive unilateral disease where tremor was the main symptom. The number of cases suitable for any form of operation was very small indeed. The effect of medical treatment varied from patient to patient and was difficult to assess because of spontaneous fluctuations in symptoms and because of psychological factors. Drug treatment influenced spasticity but did not reduce tremor. Current practice favoured the use of hyoscine or stramonium augmented by antihistaminics or dextro-amphetamine. The newer drugs, "artane" (benzhexol hydrochloride), "lysivane" (ethopropazine hydrochloride), and "kemadrin," could be used to supplement, but not to replace, traditional therapy. Encouragement and general management of the patient were often more important than the use of drugs.

Peripheral Vascular Disease

Professor E. J. WAYNE (Glasgow) considered that peripheral vascular disease in the elderly was due to atherosclerosis, the incidence of which increased with age. There was a growing mass of evidence that a high fat diet predisposed to atheroma. Obesity and excessive fat intake should therefore be corrected before old age supervened. Diminished thyroid function and diabetes were other important factors in producing atherosclerosis. The clinical features of peripheral vascular disease in the aged differed from those in younger patients in that claudication was rarer while nutritional changes, gangrene, cold feet, paraesthesiae, and cramp were commoner. Treatment should aim at preventing gangrene, by instruction in the care of the feet. Attempts to improve the blood supply were more successful when directed to the skin than towards the muscle: there was probably no effective therapy for intermittent claudication. Symptomatic treatment was needed for pain and insomnia; threatened or established gangrene required careful treatment by general measures, antibiotics, and surgery.

Professor A. M. BOYD (Manchester) emphasized the importance of oscillometry in determining whether vascular

disease was really present. There were three groups of patients with intermittent claudication. In the first group were those whose pain disappeared when exercise continued; patients in the second group were able to continue walking in spite of pain; but patients in the third group had to stop because of increasing pain. Most elderly patients fell into the last group. Surgical procedures, such as tenotomy, were more difficult in elderly patients because they brought to light other disabilities. Injection of phenol into the lumbar ganglia was a safe procedure in the aged and produced results not very inferior to those of sympathectomy. It was important to exclude an aneurysm of the popliteal artery as a cause of pain: arteriography was of great practical value in these cases. Arteriosclerotic ulcers were commonly found in peripheral vascular occlusion, and when complicated by proteus infection they sometimes resembled epitheliomata. Severe fungous infections sometimes simulated gangrene. In the treatment of gangrene it was essential to come to an immediate decision as to whether amputation would be necessary or possible. There were three common fundamental errors in the conservative treatment of gangrene: it was wrong to elevate the limb, to apply heat, and to keep the gangrenous area dry. Best results were obtained by keeping the extremity moist at a temperature of 80 to 90° F. (26.6 to 32.2° C.).

Dr. W. FERGUSON ANDERSON (Glasgow) discussed the frequency with which peripheral vascular disease was found in the elderly. In a study of normal elderly people, almost half had been found to suffer from cold hands or feet. Many others had suffered from nocturnal cramp in the legs, but some had shown spontaneous improvement. Coldness of the feet was not closely correlated with absence of peripheral pulses, but patients suffering from claudication usually had cold extremities. Many patients had derived benefit from tolazoline hydrochloride ("priscol"). Dr. O. T. BROWN (Dundee) described a mechanical device for reducing the unpleasant odour from gangrenous lesions in patients not fit enough for medical treatment. The machine developed ozone at a distance from the patient. The affected limb was covered with a bed cage into which ozone was led by polythene tubing. This device had proved both effective and safe.

Thursday, July 8

Medical Treatment of Hypertension

With Dr. W. R. SNODGRASS (Glasgow), a vice-president of the Section, in the chair, Dr. GEOFFREY BOURNE (London), opening a discussion on hypertension, said that fallacious blood-pressure readings often arose from postural blood-pressure variations or were recorded in nervous or obese patients. Significant hypertension was present when, in addition to a raised diastolic pressure, there were increased heart size, changes in the electrocardiogram, and alteration of the retinal arteries. Patients with stationary (benign) hypertension rarely had symptoms and seldom required treatment. In slowly progressive hypertension it was often sufficient to modify the patient's mode of life.

Rapidly progressive or malignant hypertension was particularly amenable to treatment. Hexamethonium drugs were unsatisfactory by mouth: the beneficial effects were temporary and the side-effects unpleasant. Pentapyrrolidinium was a better drug, but initial dosage should be small. Although sympathectomy helped some patients, it was being used less and less in treatment. On the whole the sphygmomanometer had probably done more harm than good, since both doctor and patient paid too much attention to blood-pressure readings.

A Regime of Treatment

Dr. J. GIBSON GRAHAM (Glasgow) said that hypertension was a frequent cause of death and a common reason for admission to hospital. The incidence of the disease rose rapidly after the age of 40. The commonest symptom was dyspnoea. Changes in the retinal vessels depended on the rapidity of onset of the disease and in the height of the diastolic pressure. Treatment should aim at eradicating the fundamental cause of the disease. Stress and strain probably produced high blood pressure by stimulation from the higher centres through the hypothalamus, the sympathetic chain, and the adrenal cortex. In the early stages of the disease the patient should modify his activity and take a diet containing little salt and few calories. If this did not bring relief methonium compounds should be tried. Later, other hypotensive drugs such as hydralazine ("apresoline"), reserpine, or veratrine could be added. It had been found difficult to keep the patients adequately controlled for long periods in the out-patient clinics. Nevertheless, medical methods of treatment were now better than sympathectomy.

Dr. GAVIN B. SHAW (Glasgow) had found it difficult to decide the right time to start treating hypertensive patients. A high diastolic pressure was often found in patients with no symptoms. These patients should not be treated but observed at intervals. Married women should be advised against pregnancy. There was no effective way of controlling the disease in its early stage. Prolonged use of hexamethonium drugs was of little value in long-term treatment, but it helped to lengthen life in patients with malignant hypertension. It was difficult to control patients after they left hospital, but intelligent patients sometimes managed their injections with skill. In Dr. Shaw's opinion there was really no effective treatment for hypertension.

Anticoagulants in Coronary Thrombosis

Dr. A. RAE GILCHRIST (Edinburgh) began by reviewing the pathology of coronary disease. Obliterative coronary disease usually resulted in the development of a subsidiary interarteriolar circulation. It was known that thrombosis could occur without producing infarction and infarction often occurred in the absence of thrombosis. Treatment of acute infarction remained a challenge to the physician, since one-third of the patients still died in the first six weeks, and also since the late prognosis was far from good. Anticoagulants helped by preventing extension of thrombosis and by reducing thrombo-embolic complications. Heparin should be given intravenously in doses of 20,000 units at eight-hour intervals for 48 hours as a routine in all cases, and oral anticoagulants should be started at the same time. The improvement in mortality and complications fully justified this routine, which did not entail a serious risk of haemorrhage.

In Dr. Gilchrist's opinion anticoagulants had made a valuable contribution to the treatment of coronary thrombosis in the acute phase, and probably helped in preventing late complications.

Safety of Heparin

Professor R. B. HUNTER (Dundee) said that heparin was the safest anticoagulant in coronary disease unless an obvious bleeding source was present. It was quite safe to use heparin in general practice. Injections should be given at six-hourly intervals in patients with myocardial infarction until admission to hospital was arranged. Not only did heparin prevent further thrombosis, but it helped clot resolution and caused vasodilatation. Some physicians denied the value of anticoagulants and others thought their use should be restricted to cases where the prognosis was known to be poor. However, it was likely that anticoagulants would reduce the risk of thrombo-embolic complications in all types of patient. Of the anticoagulant drugs phenylindanedione was probably the best and had largely replaced ethyl biscoumacetate.

Dr. A. BROWN (Glasgow) reminded the meeting that it was not universally accepted that anticoagulant drugs were helpful in coronary disease. Analysis of cases treated in Glasgow left no doubt from clinical and pathological evidence that great benefit accrued from their use. It must be remembered that anticoagulants had not reduced the number of deaths taking place within 24 hours of admission to hospital. There was a group of seriously ill patients

who were probably best treated in the first instance at home by the family doctor. The disadvantage of longer treatment at home was that without careful laboratory control there was a considerable risk of haemorrhage. Nevertheless anticoagulant treatment should be given whenever possible.

Anticoagulants in Thrombophlebitis

Dr. R. BODLEY SCOTT (London) read a paper on thrombosis of the peripheral veins. Thrombosis of the superficial veins caused local pain, but was seldom of great moment unless complicated by deep venous thrombosis. Thrombosis of the deep veins of the leg was attended by the dangers of pulmonary embolism and, later, of chronic venous obstruction with oedema and ulceration. Early mobilization had reduced the incidence of post-operative thrombosis to about 0.6%. Pulmonary embolism occurred in about half of these cases of post-operative thrombosis, and of these about one-third were fatal. Roughly one patient in every thousand undergoing operation succumbed to pulmonary embolism.

Post-partum venous thrombosis was less common; and the frequency of the condition in medical diseases was hard to compute. Venous thrombosis commonly followed injuries to the lower limb. The "idiopathic" variety was important, since it was sometimes the first sign of malignant disease. There was no pathological distinction between thrombophlebitis and phlebothrombosis, but when phlebitis was evident pulmonary embolism was less common.

The main importance of anticoagulants lay in prophylaxis. There was no justification for the routine use of anticoagulants in all post-operative patients; they should be used as soon as the earliest signs of thrombosis appeared, and early diagnosis was therefore most important. The results of anticoagulant therapy were difficult to assess, since early post-operative mobilization and awakening interest in the problem had coincidently affected the recognized incidence of venous thrombosis.

Early Diagnosis

Mr. R. S. MURLEY (London) dealt with the indications for anticoagulant therapy. Superficial venous thrombosis did not require treatment either with anticoagulants or with antibiotics. A prerequisite of early diagnosis of deep thrombosis was a sense of awareness of that condition. Subjective discomfort in the legs often preceded physical signs by several days. Apart from tenderness, increase in muscle girth and firmness were important signs. Localized oedema was found around superficial thrombosis, but circumferential oedema indicated thrombosis of the main veins. Pulmonary emboli were often unrecognized, the classical triad of cough, pain in the chest, and haemoptysis being uncommon. Unexplained pyrexia or calf tenderness was a warning sign, but muscle turgidity, oedema, and spreading superficial thrombosis were definite indications for anticoagulant therapy. Auxiliary methods of treatment were of help. These included elevation of the foot, light compression of the leg with bandages, and early ambulation or muscular activity in bed. Where facilities for anticoagulant treatment did not exist these alternative measures were of great value.

Dangers of Deep Thrombosis

Mr. R. B. WRIGHT (Glasgow) considered that acute superficial thrombosis was best treated by gentle external pressure and exercise. Deep thrombosis was, however, potentially dangerous. The immediate risk was pulmonary embolism: more remote risks were oedema, pigmentation, and ulceration which might develop in the affected limb weeks or months afterwards. Deep thrombosis was more common in elderly patients; it probably occurred equally often in surgical and medical patients and should be treated with mobilization and anticoagulants. Treatment should always start with heparin, since this was certain in action and easy to control. Prophylactic measures aimed at preventing stasis were better than indiscriminate anticoagulant therapy.

Discussion

In the discussion following these papers Dr. R. D. H. MAXWELL (Glasgow) said that hexamethonium compounds had proved valuable in prolonging life in patients suffering from renal hypertension. Dr. JULIUS JENSEN (Las Vegas, Nevada, U.S.A.) summarized the conclusions reached at a recent meeting of the American Medical Association on the treatment of hypertension. Many patients with hypertension required no treatment at all. When treatment was indicated, rauwolfia alkaloids should be used first. If this did not succeed, hydralazine hydrochloride should be given as well. Failing this combination of drugs, hexamethonium compounds should be tried. In the U.S.A. sympathectomy was becoming less popular in the treatment of hypertension.

SECTION OF SURGERY

Wednesday, July 7

Surgical Treatment of Peptic Ulcer

With the president of the Section, Sir HENEAGE OGILVIE (London), in the chair, a panel discussion was held on the surgical treatment of peptic ulcer. After the introduction of the speakers by the president the subject was discussed in the form of question and answer. Concerning the value of gastro-enterostomy in the treatment of duodenal ulcer, Professor C. F. W. ILLINGWORTH (Glasgow) said that the early results of any treatment were invariably better than the late ones. However, at least half such gastro-enterostomy patients in Glasgow were well after 20 years, half the remainder had a little indigestion, and half had more severe trouble. He recommended this procedure for those over 50, for women, and for less fit patients. Dr. F. AVERY JONES (London), describing himself as "an impure physician," was not prepared to go as far as the previous speaker. Stomal ulcer occurred in a fair number of female and elderly patients, and pure gastro-enterostomy was therefore a debatable operation. Mr. JOHN BRUCE (Edinburgh) largely agreed with Professor Illingworth. He emphasized that women were more liable to anaemia and nutritional disorders following partial gastrectomy. He approved of gastro-enterostomy with the addition of a vagotomy. Sir HENEAGE OGILVIE thought that the Scotsman had a tougher stomach, and Mr. R. L. HOLT (Manchester) agreed that ulcers varied a good deal in different places. He thought elderly patients were almost as liable to stomal ulceration as the young following simple gastro-enterostomy. Summing up this question, Professor ILLINGWORTH said that with the decreasing risks of perforation and haemorrhage it should be recognized that partial gastrectomy could be one of the major mortality risks of the peptic ulcer patient.

In discussing the operation of vagotomy alone it was agreed by all the speakers that this operation was not justified in the treatment of duodenal ulcer; but Mr. HOLT emphasized the good results which he had had during the last seven years when combining this procedure with a gastro-enterostomy. Of his 250 hospital cases 95% were doing their old job, and only one had a stomal ulcer. Certain troubles such as regurgitation of bile and diarrhoea did occur in a minority of cases. Sir HENEAGE OGILVIE observed that it took many years for a bad gastric operation to be found out. After further discussion Dr. AVERY JONES, in summing up, thought that, while there was no question about vagotomy alone being bad, he was not at all happy about its reintroduction combined with gastro-enterostomy. He had, in fact, seen three stomal ulcers in 28 patients treated in that way. This speaker made a plea for proper clinical trials of the various operative methods of treatment.

Replying to the question as to what should be done with the patient who had recurrent haematemesis without demonstrable ulcer on radiology or at operation, Mr. BRUCE favoured "blind" gastrectomy following full exploration, and Professor ILLINGWORTH supported this. In connexion with this type of case Dr. AVERY JONES said that gastro-

scopy a few hours after bleeding had stopped could be informative. He also advocated gastrotomy and adequate inspection and palpation of the gastric mucosa at the time of operation. Subsequent surgical speakers did not favour this line of procedure, but Mr. R. S. MURLEY (London) said that, lest Dr. Avery Jones should feel like Daniel in the lions' den, he had found gastrotomy of very real value. In particular he emphasized that a high shallow ulcer of the stomach could be detected before gastrectomy was embarked upon. A further question was asked on persistent bilious vomiting following the Polya operation, but Mr. BRUCE thought it was not related to any particular type of procedure. In connexion with the decreasing mortality rate from perforated ulcer it was generally agreed that earlier diagnosis and improvements in the ancillary treatment had been far more important than advances in surgery. Referring to the subject of immediate partial gastrectomy for perforation, most speakers agreed that it was a procedure of value so long as it was done in carefully selected cases by a really competent surgeon. It had a particular place in the treatment of gastric perforations. There was fair agreement that the conservative treatment of perforation had definite but rather limited value. Amongst the concluding questions was one from Mr. R. V. COOKE (Bristol), who inquired how well duodenal ulcer patients fared in the hands of the "pure" physician. Dr. AVERY JONES, replying in this guise, stated that one-third did well, one-third did badly, and eventually earned their surgery, whilst the remainder apparently lived on moderate terms with their ulcer.

A summary cannot do justice to the questions and the detailed answers which were given by the various members of the panel, but it was generally adjudged a very satisfactory way of airing all points of view on this important subject.

Peptic Ulcer in Women

Mr. DOUGLAS H. CLARK (Glasgow) then followed with a short paper on the "Effects of Pregnancy and the Menopause on the Course of Peptic Ulcer." He had studied a series of 400 female patients, the majority of whom had duodenal ulcer, the information being partly volunteered by the patients and partly given in reply to specific questions. There was no doubt that a very large number of women with peptic ulcer symptoms experienced considerable improvement during pregnancy, but recurrence of trouble following delivery was invariable. About one in every ten patients was worse during pregnancy. He emphasized the large number of complications of ulcer occurring within a month or so of delivery. A series of graphs was shown depicting the age of onset of ulcer and the relationship of this to the menopause in both duodenal and gastric cases. Replying to questions in the subsequent discussion Mr. Clark said that he could not state to what extent improvement during pregnancy was due to the contentment of the woman. He had not found oestrogen treatment to be of any value in the non-pregnant ulcer patient, and that he did not think the peak incidence of this trouble around the menopause was due to the ameliorating effects of earlier pregnancies.

Cartilage Implants

The concluding short paper was by Mr. THOMAS GIBSON (Glasgow) on "Cartilage Implants in Surgical Repair." He described the results of some interesting work on the use of both transplanted human and bovine cartilage grafts. After referring to the unfortunate tendency of thin cartilage to warp and twist, the histological changes occurring in the course of their absorption were illustrated. Owing to difficulties which sometimes arose in connexion with the removal of rib cartilage, bovine grafts had been somewhat enthusiastically recommended. Earlier claims that they were superior to autografts had not been substantiated. Working in conjunction with Dr. W. Brian Davis, some interesting experimental work had been done in which it was shown that, however such cartilage was prepared and preserved, absorption tended to occur. Thicker blocks of cartilage were, however, less liable to undergo absorption and lasted a good deal longer. It had been shown that, in contradistinction to the smaller and thinner grafts which became invaded by fibroblasts and then absorbed, these larger grafts tended to become walled off by fibrous tissue with a smooth lining like that of an adventitious bursa. In conclusion he stated that thin sheets of cartilage and diced grafts were useless and would disappear within 18 months. Block grafts would last longer and were perhaps of value where a patient was not yet fitted for a more extensive operation, such as bone grafting. In view of the tendency for such blocks to become surrounded by fibrous tissue, he suggested their possible value in arthroplasty.

SECTIONS OF SURGERY AND CARDIOLOGY

Thursday, July 8

Mitral Stenosis

With the vice-president, Professor C. F. W. ILLINGWORTH (Glasgow), in the chair, Professor W. A. MACKEY (Glasgow) opened a discussion on surgery in the treatment of mitral stenosis. He said that this was a field of therapeutic endeavour in which the medical profession in Britain could justly take pride. Probably the earliest successful attempt had been that made by Souttar in this country 30 years ago, and more recent advances, starting with the paper in 1950 by Baker, Brock, and Campbell, had been to a material extent due to the efforts of British teams. The surgeon should see the patient before operation, continued Professor Mackey, explain the likely course in the first post-operative days, and institute respiratory exercises. Good anaesthesia was perhaps the most important single factor in achieving success. The heart was usually remarkably tolerant, but, if found irritable, intravenous procaine amide produced tranquillity. When approach through the left auricular appendix was not possible owing to thrombosis, entry might be made through a pulmonary vein. With growing experience it was possible to concentrate on achieving a commissurotomy that would allow the valve to admit two fingers. Calcification of the valve might still permit a successful split. When using a knife there was some risk of dividing chordae tendineae and producing valvular incompetence. In 146 patients operated upon during the past five years, there had been five deaths related to either an incomplete diagnosis or failure to achieve an adequate valvotomy. The mitral orifice was less than 1 cm. in diameter in 37 of 136 patients; the cusps were calcified in 35 of 137 patients, and thick and gelatinous in 12 of that series; the remainder were fibrous, leathery, or nodular. After valvotomy in 100 patients the left auricular pressure fell immediately from an average of 35 to 23 mm. Hg, and the pulmonary artery pressure fell from an average of 59 to 49 mm. Hg. Slides were shown indicating steps in the operative procedure.

Dr. MAURICE CAMPBELL (London) discussed the choice of patients for mitral valvotomy and the results obtained. Although the operation was little more than five years old, it might now be accepted that it could give good results in over 60% of suitable patients, with a mortality that varied between 5 and 10% according to the type of patient selected. The time had hardly yet arrived for the full assessment of results, but optimism was perhaps a little less than two years ago. After emphasizing that some cases of mitral stenosis could be very mild, permitting survival to 60 or more, Dr. Campbell drew attention to the crucial moment which the general practitioner could well recognize, when the patient made a rapid change for the worse. The prognosis might then be an average of seven years' survival, with wide variations. The patient now found difficulty in earning his living or in doing essential duties in the home. That was the time to consider valvotomy. Dyspnoea with tightness in the chest on exertion, orthopnoea, paroxysmal dyspnoea (cardiac asthma), especially at night, and, still more, acute pulmonary oedema were special indications, and if these occurred with little else the result should be good and

lasting. The addition of other findings—auricular fibrillation, a large heart, a history of congestive failure, mitral regurgitation, or aortic disease—did not prevent great improvement if the mechanical obstruction of mitral stenosis was the main lesion, but did mean the benefits of operation could not be expected to last as long. An opening snap gave a hint of suitability for operation. Fatigue was not a symptom of heart disease, and the more obtrusive it was the less the indication for surgery: it might occasionally suggest active rheumatism or bacterial endocarditis. Dr. Campbell had conducted a careful follow-up of 65 patients who obtained good or excellent results more than two years ago. Any loss of the ground gained was rare in the first year, but relapses seemed to occur in about 3% in the second year, and this rose to about 8% in the fourth year. A rather larger number of patients lost some of their improvement but were still very much better than before operation, and the corresponding figures for these were about 5 and 12% in the second and fourth years respectively. The proportion losing ground each year seemed to be progressive, but the figures for the fourth year were still very small and these results could be regarded only as preliminary. These results emphasized the need for prolonged follow-up studies of ordinary cases of mitral stenosis in which operation had not been performed, so that the estimate of benefits obtained might be more exact. The general practitioner was well placed to observe the results of valvotomy in terms of the ability to cope with the demands of ordinary life. Laboratory methods, though no better criteria, did show a substantial fall in pulmonary artery pressure from an average of 75/35 to 37/18 mm. Hg.

Recognition of Mitral Incompetence

Dr. R. W. D. TURNER (Edinburgh) discussed physical signs which would help to eliminate candidates for operation with a significant mitral incompetence. The physician who frequented the operating theatre soon found his diagnosis confirmed or confounded, and physical signs had thus acquired a new significance. They had become even more reliable than laboratory methods, and exploratory cardiotomy should now be a rarity. A heaving left ventricular impulse was highly suggestive of mitral incompetence, provided hypertension and aortic valvular disease could be excluded. A systolic murmur, when harsh, loud, and long, and maximal at the apex, suggested incompetence. A systolic murmur maximal at the base suggested aortic disease; if loudest to the right of the sternum, tricuspid incompetence was likely. With a few exceptions, the absence of a systolic murmur excluded mitral incompetence. A mitral presystolic murmur made significant incompetence unlikely. If the mitral first sound was not loud and abrupt, the explanation was either a rigid valve or, more commonly, complicating incompetence. The electrocardiogram revealed right ventricular preponderance in only half the patients with severe stenosis. Left ventricular preponderance was a late sign of incompetence, and then hypertension or aortic disease required exclusion. In radioscopic studies assessment of left ventricular size was often difficult and the size of the left auricle, though more often larger with incompetence than with stenosis, could be misleading. Systolic pulsation of the left auricle was not confined to incompetence. Calcification suggested incompetence but might sometimes explain a systolic murmur, a modified first sound, and a modified opening snap in the presence of stenosis. A careful assessment of all physical signs was the most important factor in accurate diagnosis.

Mr. P. R. ALLISON (Leeds) described a method of measuring the left auricular pressure in mitral stenosis, by puncture of the left auricle through a bronchoscope. The aortic or right pulmonary artery pressures could be measured by the same route, since all three structures had a precise relationship to the carina. Sometimes a large pulmonary artery made access difficult to the left auricle below it. There had been no mortality or morbidity in 81 punctures, and the procedure was claimed to be simple, brief, and applicable to out-patients. If the left auricular pressure was normal, operation was not required; hence the ease of selection. Mr. Allison showed tracings of left auricular pressure, defining the A C V waves, similar to pulmonary capillary pressure curves, and he produced a formula for assessing the degree of regurgitation.

Arterial Grafting

Mr. H. H. G. EASTCOTT (London) described the history of arterial grafts. Since arteries from young subjects were difficult to acquire, it was necessary to conserve them until needed. Saline refrigeration was adequate for periods up to a month, but for longer conservation the deep-freeze bank was devised after studies in America with R. E. Gross and and C. A. Hufnagel, and was installed at St. Mary's Hospital, London (Professor C. G. Rob). The graft bank consisted of small chambers surrounded by ice and solid carbon dioxide, and the cost of running it was about £70 a year. The tissue froze solid and remained unchanged until thawed by warm saline. It had then been shown to be physically and histologically unchanged. A freeze-drier had also been devised, by which the graft's moisture was extracted. Before use the graft was allowed to take up saline for half an hour. Mr. Eastcott stressed the need for using the patient's own tissues whenever possible, as in treating wounds. The knowledge that a graft was available enabled the surgeon to embark upon a precarious reconstruction of an artery. Fifty-seven grafts had been used, and examples were given of their value in the treatment of peripheral aneurysms and local arterial blocks. Four operations had been done under hypothermia.

Mr. W. P. CLELAND (London) discussed the use of grafts for congenital and other abnormalities of the aorta. R. E. Cross, with experience of 46 grafts in the U.S.A., had noted no aneurysms and only slight calcification of the graft in some instances. There was good evidence of the safety of grafts. A successful graft for a post-stenotic aneurysm in a child had been followed up for two years, but it was uncertain how the graft would behave in the next few years. Caution was necessary in using grafts in children. The technique of conservation was satisfactory and the graft was easily manipulated. The chief problem was the maintenance of the circulation in the renal arteries and spinal cord when the collateral circulation was not developed as in aneurysms. Extra-arterial shunts of polythene tube or temporary intra-arterial tubes were used, but hypothermia had largely obviated the need for these methods. Grafts had enabled the surgeon to operate with confidence on coarctations which would have been hazardous hitherto. Mr. Cleland had used grafts in 11 cases, including an infected aorta below the coarctation and a dissecting aneurysm. There was still no solution to aneurysm of the aortic arch.

SECTION OF OBSTETRICS AND GYNAECOLOGY

Wednesday, July 7

Management of Labour in Contracted Pelvis

With the president, Professor R. A. LENNIE (Glasgow), in the chair, Dr. H. R. MACLENNAN (Glasgow) opened a discussion on the management of labour in contracted pelvis. Tracing the evolution of the methods of management over the past 50 years, he said that destructive operations were rarely performed to-day, and that classical caesarean section had been largely superseded by the lower-segment operation. Over the same half-century severe degrees of pelvic contraction had become much less common, but minor degrees, mostly due to rickets, still caused dystocia. He criticized the treatment of these patients in ever-increasing numbers by elective caesarean section and justified the induction of premature labour in selected cases in hospital practice with a view to encouraging vaginal delivery. If the trial of the induced labour failed, it was to-day possible to resort with safety to abdominal section.

Professor W. I. C. MORRIS (Manchester) dealt with contraction of the pelvic outlet, describing in detail the clinical methods of outlet pelvimetry. He said that gross contraction of the plane of least pelvic dimensions was very rare

but could cause obstruction to labour. The commonly seen narrow subpubic angle was important in so far as it was a possible factor in injury to the soft tissues, especially in primigravidae. The management of outlet contraction was bound up with its recognition, which might not be easy. The most important measurement was the lowest sacro-pubic diameter. When this exceeded 4½ in. (11.5 cm.) contraction of the outlet was unlikely, but when it was less than 4 in. (10 cm.) full radiological studies were indicated. The induction of premature labour was not favoured for outlet contraction, a condition which of itself rarely justified elective section, although the presence of other additional unfavourable factors might make such intervention necessary. Professor Morris said that cautious optimism was the right attitude, for delivery was commonly spontaneous. Episiotomy and forceps delivery were indicated for delay of the head on the pelvic floor. But if the head were arrested in the pelvic cavity he favoured a trial of forceps in the operating theatre with everything prepared for caesarean section. The theoretical arguments in favour of symphysiotomy were strong, but it was difficult to recognize the suitable case at a stage when the baby was still undamaged.

Risk to the Foetus

Dr. J. BRUCE DEWAR (Dumfries) said that, while over the past 30 years the maternal mortality in cases of contracted pelvis had become negligible, the foetal mortality had been reduced by little more than half. The management of labour should be a planned procedure determined by antenatal assessment, qualified by factors such as foetal size, presentation, and, in multiparae, previous obstetric history. But the plan must be flexible in operation because two important factors—uterine action and moulding—were largely unpredictable. He regretted that radiological pelvimetry was not always employed to full advantage. Some 60% of women who were 5 ft. (1.5 m.) or under in height showed features of pelvic contraction, but any woman, whatever her height or stature, might have some aberration of pelvic shape or size that could prejudice the normal outcome of labour. Where contraction was limited to the pelvic brim, the foetal head was the best pelvimeter. Contractions at lower levels were easily missed clinically, yet might produce second-stage dystocia and result in foetal death. Dr. Dewar admitted that the assessment of mid-plane and outlet contraction by *x*-ray pelvimetry tended to overemphasize potential difficulty which might never arise, but it had the advantage of leading to preparation being made for difficulty and delay. The need for elective caesarean section was usually obvious, but the safety of the lower segment operation often justified a trial of labour, always provided that such trial was not continued beyond the limits of maternal and, more especially, of foetal endurance. He doubted the value of the induction of premature labour for pelvic contraction. The earlier the induction the greater the foetal risk; the later the induction the less it was justified.

Dr. M. A. MAJEKODUNMI (Nigeria), Dr. A. P. BARRY (Dublin), Professor GILBERT I. STRACHAN (Cardiff), Mr. LESLIE WILLIAMS (London), Dr. (Mrs.) LAKSHMI YOWRANGA RAO (Madras), Sir BERNARD DAWSON (Dunedin, New Zealand), Professor G. GORDON LENNON (Bristol), Mr. W. HAWKSWORTH (Oxford), and Dr. DECLAN J. MEAGHER (Dublin) participated in the general discussion.

Early Diagnosis of Uterine Cancer

Dr. W. F. T. HAULTAIN (Edinburgh), a vice-president of the Section, took over the chair when a discussion on the early diagnosis of uterine cancer was opened by Mr. R. M. CORBET (Preston). He drew attention to the small percentage of cases diagnosed early enough to offer a high rate of cure. Admittedly cancer sometimes spread very quickly, but delay in diagnosis was usually due to the silent nature of the disease, to fear, and to ignorance. He therefore suggested more widespread teaching of women regarding the course of the normal menopause. The incidence of uterine cancer was such that individual general practitioners saw few cases and therefore could not become expert in the early diagnosis. All women about whom there was the slightest suspicion of cancer should therefore be sent for a thorough gynaecological examination. The gynaecologist in the non-teaching hospital had an important part to play here, for he must arrange to see patients without delay and admit them immediately if necessary. He must be thorough in his examination yet not overburden the pathological department. He would then recognize the early case and avoid performing an inadequate operation on an unsuspected cancer.

Professor G. GORDON LENNON (Bristol) considered the problem from the point of view of the general practitioner and offered some guiding principles to help him. First, he emphasized the importance of a vaginal examination in every case of irregular or abnormal menstruation and deprecated the prior employment of hormone therapy. Pain was an initial symptom in only 2% of cases. In the vast majority the primary complaint was vaginal haemorrhage or blood-stained discharge, especially after coitus, douching, vaginal examination, or micturition. No gynaecologist would complain if his clinics were overcrowded with such cases. Symptoms must never be ascribed to the onset of the menopause until thorough examination, including curettage, had excluded cancer. *X*-ray therapy to stop heavy bleeding at the menopause, without preliminary curettage, was indefensibly bad practice. Cancer education was often discussed, but the much more important menstrual education was relatively neglected. Short of a cure for cancer of the uterus, efforts must be directed to prevention or, at the worst, to early diagnosis. But Professor Lennon was not convinced that vaginal cytology was the answer to the last.

Cytological Diagnosis

Professor H. C. MCLAREN (Birmingham) presented a report on the first two years' work of the cytological diagnostic centre in his department. All new gynaecological out-patients, regardless of age and symptoms, had been screened. A standard case-sheet was used, so that certain questions aimed at the exclusion of cancer were asked in every case. The clinician had to write down his opinion on the presence of cancer, and his proposed course of action. It was an important aspect of the investigation to give the patient no idea that she was being subjected to any special test for cancer. Professor McLaren illustrated how close liaison between the gynaecologist and the cytologist benefited the patient, particularly in the rare case where a decision on surgical treatment rested solely on repeatedly positive smears. Professor McLaren and his colleagues had set out to answer three questions: how many cases of invasive and pre-invasive cancer which evaded the clinician could be diagnosed by cytology; whether it was essential for a well-equipped gynaecological unit to have facilities for cytological diagnosis; and whether the service should be used to screen all patients or be reserved for those presenting unusual diagnostic problems. Further experience was needed before these questions could be answered, but so far they had been greatly impressed by the advantages accruing from the use of their cytological diagnosis centre.

Miss M. E. ATTWOOD (Birmingham) described the technique for taking and examining smears and discussed the results. A total of 1,750 out-patients had been screened by both clinician and cytologist. Forty-four cases of invasive or pre-invasive cancer had been diagnosed; six of these were unsuspected clinically and these were the "cytological pick-ups." They comprised four cases of carcinoma of the cervix, one case of cancer of the vagina, and one of carcinoma corporis uteri. This last case demonstrated a possible source of error in the method. When either the aspiration specimen was very diluted with blood or the tumour did not exfoliate a random sampling of fluid from the posterior fornix would not contain malignant cells. The accuracy of positive smears had been 86%, and of negative smears 99.7%. On six occasions smears were reported as suggestive of carcinoma corporis where subsequent curettage showed only glandular hyperplasia. This emphasized that active atypical cells from the endometrium could be mistaken for malignant cells, because they might degenerate

during their passage down to the posterior fornix. Miss Attwood said that one hour of a technician's time was spent on each case, so that about 400 hours' work was done to obtain one "pick-up." It was realized that some cases of cancer might have evaded both clinical and cytological examinations, but screening by the latter method did close the net a little more.

Mr. M. J. D. NOBLE (Birmingham), Professor GILBERT I. STRACHAN (Cardiff), Mr. R. B. K. RICKFORD (London), and Mr. LESLIE WILLIAMS (London) spoke in the subsequent discussion.

Thursday, July 8

Indications for Induction of Labour

Mr. R. M. CORBET (Preston), a vice-president of the Section, was in the chair when Dr. R. A. TENNENT (Glasgow), before a large audience, opened the discussion on indications for induction of labour. He said that labour could be induced either to terminate a pregnancy which was adversely affecting mother or foetus or to promote labour at a time when complications were less likely. The most frequently used method of surgical induction was artificial rupture of the membranes, a procedure from which chemotherapy had removed serious risk. Dr. Tennent then described a series of 1,585 cases induced in the years 1951–3. The main indication for intervention had been toxaemia, prolongation of pregnancy beyond 41 weeks, minor degrees of contracted pelvis, excessive growth of the foetus, and previous caesarean section. There had been only one maternal death, and the corrected foetal mortality had been 2.3%. The caesarean section rate had been 2.9%. He therefore concluded that the judicious induction of labour could give satisfactory results with a low section rate. This was important at a time when there was a tendency to consider that the outcome of labour should be either easy vaginal delivery or caesarean section, a tendency which had led to a steady rise in section rates.

Mr. S. W. MASLEN-JONES (Wolverhampton) welcomed any measures which would prevent undue recourse to caesarean section, but he hoped that induction would not become as popular again as it once had been. Toxaemia was the major indication for induction, but obstetricians often resorted to induction too early. In the primigravida induction was seldom indicated, but the multigravida with a history of big babies was eminently suitable for this procedure. He could not agree that the scar of a previous section was of itself an indication for induction, for rupture of such a scar most commonly occurred prior to the onset of labour. With regard to post-maturity, he had induced only in the face of threatening disproportion, but he had been impressed by recent work on foetal anoxia in relation to prolongation of pregnancy and now induced at the end of the 41st week. Mr. Maslen-Jones expressed anxiety regarding the trend to freer resort to all forms of interference. The security offered by chemotherapy and antibiotics might not prove permanent, and in the meantime there might be some neglect of the traditional art of obstetrics.

Foetal Deaths after Termination of Pregnancy

Mr. LESLIE B. PATRICK (Sheffield) said that toxaemia was one of the main indications for the surgical induction of labour, and he compared the causes of foetal deaths in a group of 51 pregnancies terminated for toxaemia before the 36th week according to the method of termination. The deaths after caesarean section were due to post-natal conditions; those after artificial rupture of the membranes were almost all due to intrapartum conditions which might have been avoided by section. His results supported the findings of others that if the baby weighed 4 lb. (1.8 kg.) or less, then section offered the best chance of survival. The place for surgical induction in post-maturity was still not clear. Foetal distress was more likely to occur if the cervix was not ripe at the time of induction—and the cervix might not be ripe in cases which on other grounds appeared post-mature. He thought there was also a place for induction in some cases of Rh-isoimmunization. He believed that induction for contracted pelvis was suitable only where the degree of contraction was minor, but those were the cases which would give a high percentage of spontaneous and often easy deliveries at term. Mr. Patrick concluded that the trend in obstetrics was towards intelligent anticipation of difficulty. Surgical induction was a means to this end, but it was not in itself entirely free from danger. This was because induction was sometimes indicated when the conditions ideal for its employment, a ripe cervix and a low head, were not present.

Professor R. A. LENNIE (Glasgow), president of the Section, Dr. E. PARRY JONES (St. Asaph), Mr. S. BENDER (Liverpool), Mr. PERCY PHILLIPS (Bristol), Mr. LESLIE WILLIAMS (London), Dr. DECLAN J. MEAGHER (Dublin), Dr. S. A. BOND (Cheltenham), Dr. OOI KEE WAN (Malaya), Dr. M. COHEN (London), and Mrs. CONSTANCE L. BENYON (Brighton) joined in the subsequent discussion.

Endometriosis

Dr. JOHN HEWITT (Glasgow), a vice-president of the Section, occupied the chair when Mr. LESLIE WILLIAMS (London) opened a discussion on endometriosis by describing the various lesions which might be found. Endometriosis interna, or adenomyosis, was due to down-growths from the endometrioma lining the uterine cavity. Endometriosis externa might be explained by Sampson's implantation theory in some cases, but most now favoured the theory of serosal metaplasia in the ovarian germinal epithelium with the formation of ovarian surface endometriosis; the rupture of such of a focus could cause scattered implantation of endometriomatous fragments. In other sites, however, such as the vulva, the lesions arose by lymphatic spread. Mr. Williams then reviewed the symptomatology in the light of 128 cases seen at the Samaritan Hospital, London. Two-thirds of the women were in the 37–46 age group, and over 80% had been pregnant at least once. Only one-third had complained of dysmenorrhoea, and in only one in ten was it the leading symptom. Dyspareunia was an infrequent complaint. The principal symptom was menstrual irregularity, with lower abdominal pain the next most common. He could offer no explanation why some women had severe pain when others with exactly similar lesions had no pain at all. In some cases the diagnosis was clearly indicated by the physical signs, but in others it presented great difficulty. Indeed, the nature of the lesion might be demonstrated only at operation or on histological examination of excised tissue. But he had found pelvic ultra-short-wave therapy useful diagnostically, as it eased the pain in chronic pelvic infection, unless it was tuberculous, but aggravated the pain in endometriosis.

Dr. JOHN STURROCK (Edinburgh) reviewed the treatment of endometriosis, and said that active treatment could be either direct or indirect. The former involved removing the endometriomatous node or containing organ; the latter entailed bringing ovarian function to an end either surgically, radiotherapeutically, or by hormone therapy. Dr. Sturrock then gave his own opinion on these different methods. He had had no personal experience of hormone treatment with either androgens or oestrogens. A menopausal dose of *x* rays had several disadvantages, but might be considered where surgery was risky or had previously failed. He then reviewed 150 cases of endometriosis treated surgically at the Edinburgh Royal Infirmary, with special reference to the relief of symptoms, the conservation of ovarian function, and the possible retention of the function of child-bearing. He noted the high incidence of major post-operative complications in the radical operations. Seven out of 18 married women in whom surgery had been conservative became pregnant.

Mr. W. HAWKSWORTH (Oxford) discussed endometriosis in relation to infertility. He reviewed 100 cases of endometriosis in married women seen in the past ten years in his area. Eighty-six of the women were in the 30–50 age

group, and 32 had never conceived and 63 had not been pregnant for over ten years. In 20 younger women whose presenting complaint had been sterility, conservative treatment had been followed by pregnancy in seven. Mr. Hawksworth cited illustrative case histories and concluded that promise of relief of sterility in cases of endometriosis should be guarded, especially as the cause of the infertility was unknown.

Mr. H. R. MACLENNAN (Glasgow), Mr. R. M. CORBET (Preston), Professor G. GORDON LENNON (Bristol), Professor Dr. McK. HART (Glasgow), Mr. PERCY PHILLIPS (Bristol), and Dr. D. W. HENDRY (Nuneaton) joined in the discussion.

SECTION OF CHILD HEALTH

Wednesday, July 7

Aetiology and Treatment of Marasmus

The president, Professor STANLEY G. GRAHAM (Glasgow), took the chair for the first part of the meeting when recent views on the aetiology and treatment of marasmus were discussed. Professor J. M. SMELLIE (Birmingham) surveyed the problem historically from the year A.D. 1600, when Soranio introduced the term "marasmus" to describe the condition of infants who were suffering essentially from starvation. In days gone by this was produced simply by lack of food or by the use of unsuitable foods, but these causes rarely operated nowadays in Britain. By contrast, scientific studies of nutrition had directed attention to conditions inherent in the baby rather than in his diet, so that abnormalities of digestion or metabolism were now sought in marasmic infants. After describing different varieties of these disorders, Professor Smellie paid tribute to the social and medical work which had made ordinary malnutrition so uncommon.

Professor W. S. McR. CRAIG (Leeds) pointed out, in discussing the social aspects of marasmus, that in many countries inadequate food production, ignorance and superstitious tradition, poverty, infection, helminth infestation, and the ravages of war were still enormously more important than rare physiological disorders. Genetic factors might be more significant than had been realized. While Professor Craig spoke a series of lantern slides of undernourished children added a horrifying impact to his thesis, and emphasized the importance of his proposals for planning ahead when nutritional difficulties might be expected.

Professor R. W. B. ELLIS (Edinburgh) said that, even when the primary cause of the wasting disease had been treated, a state of profound anorexia and failure to gain weight, even with a fair calorie intake, often persisted. This had to be treated by a conventional regime of feeding, and he thought that there was also a place for endocrine replacement therapy in some cases—insulin, testosterone, and cortisone being useful for short periods. Such treatment was not, however, enough by itself; the anorexia resembled the loss of the will to live of adults, and needed mental treatment. A healthy baby was fed by a mother with smiling attention, a sick infant was surrounded by gloomy and anxious faces at home or by brisk competence in hospital. Mothers feeding their babies in hospital should be encouraged to do it their own way, and not be intimidated by criticism and "a hovering of starched Nightingales."

Dr. REGINALD LIGHTWOOD (London) described two uncommon but not rare disorders of nutrition which he has particularly studied. Idiopathic renal acidosis in infants seemed to be produced by loss of sodium bicarbonate in the urine; it might be treated by giving alkalis by mouth, and in most cases recovery occurred after some months. Idiopathic hypercalcaemia had been recognized more recently and less was known about it. It was often fairly mild, but there was also a severe form with a peculiar facies and osteosclerosis; cerebral and renal changes might be permanent sequelae. Possible methods of treatment were to give a diet containing very little calcium or to increase calcium elimination, which could be done by administering chelating agents—for example, "versene"—or by producing a therapeutic acidosis.

Dr. ROBERT A. SHANKS (Glasgow) concluded the discussion by describing fibrocystic disease of the pancreas, which might appear as a wasting disease with steatorrhoea, although marasmus was not a presenting feature in other forms of the disease.

Acute Haematogenous Osteitis

Dr. BERNARD E. SCHLESINGER (London), a vice-president of the Section, took the chair for the second part of the meeting.

Mr. MATTHEW WHITE (Glasgow) first surveyed the changing picture of acute haematogenous osteitis, seen in a quarter of a century's practice. In the first phase there had been a mortality of 33% due to septicaemia, which was unaffected by the type of operation. In the second phase the septicaemia was overcome by the use of antibiotics, and the death rate fell to 2%; surgery was still needed except when treatment was started early. The third phase was disquieting. In some cases antibiotics were not effective, there were more subacute cases in which diagnosis was difficult, and there was an apparent increase in the number of newborn babies affected. Staphylococcal epiphysitis was producing in a few patients intractable deformity due to interference with growth. Mr. White suggested that research into the effect of antibiotics on local tissue response and on the development of immunity was badly needed.

Dr. G. A. NELIGAN (Newcastle-upon-Tyne) distinguished between mild cases, common under the age of 3 years, and severe cases usually in older patients. It was in the latter that early diagnosis was important. It was a clinical diagnosis which was in some ways easier to make early than late, provided that the full picture of a systemic illness with a significant local lesion was recognized. In a hundred cases he had seen himself delay was more often due to failure of the family doctor to appreciate the picture than to failure of the family to seek advice. Dr. Neligan described the signs and symptoms which make it possible to get treatment started within 48 hours of the onset.

As the chairman remarked, Edinburgh and Glasgow might be relied on to produce contrasts, and Mr. J. J. MASON BROWN (Edinburgh) said that he had enjoyed better fortune with penicillin than had Mr. White. However, after the third day antibiotics alone were not effective, for they could not reach the bone if its blood supply were impaired, nor would they sterilize an abscess. Incision and drilling of the bone were important, for intra-osseous tension must be relieved. Antibiotic treatment should be continued until bone infection was eliminated.

Mr. R. B. ZACHARY (Sheffield) described the difficulties of diagnosis in neonatal cases, in which there might be no fever, pain be difficult to detect with certainty, and swelling occur late. All his cases were given antibiotics, but possibly in some it was unnecessary.

Dr. I. A. B. CATHIE (London) said that he had found little increase in the proportion of strains of staphylococci insensitive to penicillin between 1948 (9.8%) and 1954 (12%), in a general children's hospital. Penicillin was still satisfactory for most cases of osteitis. In 5 out of 117, however, ever, there had been a salmonella infection which was resistant. He had been asked to talk about the choice of antibiotic, but the pathologist could only indicate which might be successful, it was for the clinician to choose one, or a combination of two. The pathologist could help by the rapid assay of sensitivity by direct plating of pathological material, identification of the organism being left till later.

Thursday, July 8

The Care and Management of the Epileptic Child

With Professor J. L. HENDERSON (Dundee), a vice-president of the Section, in the chair, Dr. J. ROMANES DAVIDSON (Bridge of Weir) opened a discussion on the care and management of the epileptic child. He showed how large

the problem was by examining figures for the incidence of epilepsy in children, and concluded that it was about 1.7 per 1,000 in Britain. The first thing in management was to explain the nature of the condition to the parents, to dispel their fears and uncertainties, and to gain their co-operation; later the child also must be taught to accept the situation. His education was all important, and it was worth stressing that an epileptic child was not necessarily an epileptic pupil. In one English group 330 of 365 epileptic children were at ordinary schools. Defective intelligence, behaviour problems, or severe fits at school might make ordinary education impossible. Children with either of the latter two disabilities did well in special residential schools for the physically handicapped, but mentally retarded children should go to schools for the educationally subnormal. Temporary admission to a special institution was helpful in giving the parents two or three weeks in which to have a holiday. The recent Ministry of Health circular rightly stressed the need for repeated assessment of the epileptic child's ability, but Dr. Davidson was concerned lest the recommendation of early notification of epileptics might do harm in some cases. Others who spoke later also expressed their apprehension about this.

Dr. D. A. POND (London) described some of the varieties of fits and behaviour disturbances in epileptic children, and agreed with Dr. Davidson that very few of them caused much trouble, but when they did it was quite out of proportion to their numbers: "Ten per cent. of the ten per cent. who cannot go to school cause more trouble than all the rest put together." Children with classical petit mal were passive peaceful children, and often had parents of middle-class outlook who subtly rejected them. Children with temporal-lobe epilepsy, on the other hand, had aggressive tantrums and a genius for annoying people: they provided the drama of the clinic. Sometimes they contained their aggressions by adopting obsessions which might be equally disturbing. Investigation of these patients was often difficult, but temporal lobectomy had produced brilliant results in cases resistant to medical treatment. Two other epileptic variants were resistant to treatment and produced social defect; in them as in the others the doctor must guide the parents through the "macabre folklore of epilepsy," dispel the idea that the divine disease was a divine punishment for parental sin, and assure them that the child with fits was not the future lunatic, murderer, or drug addict.

Dr. J. P. M. TIZARD (London) emphasized that even if medicines could not cure epilepsy, at least time was on their side, so that treatment should be based on its effect on the present state of the child, and not on his problematic future. The doctor must take the lead in dealing with the parents and not leave it to them to express their fears unasked; emotional tension at home often increased the number of fits. Barbiturate and paraldehyde should be injected in status epilepticus, but if this was not controlled in half an hour the child should be admitted to hospital. In prophylaxis the usual drugs should be used, novel preparations being preserved for intractable cases. "Lightning fits" (hypsorhythmia) were the most refractory and were followed by mental deterioration, and in them it might be worth trying aureomycin.

Mr. F. J. GILLINGHAM (Edinburgh) described the investigations which were used in cases needing surgical treatment, and illustrated with a fine series of slides the effects of local cerebral injury, incisural scarring of the uncus produced by tentorial herniation following cerebral crushing injuries at birth, arterial occlusion, subdural haematoma, cortical thrombophlebitis resulting from infection elsewhere, venous sinus thrombosis in dehydrated babies, and congenital vascular lesions.

Drug Treatment

In the discussion which followed, Dr. R. A. SHANKS (Glasgow) mentioned the danger of hyperthermia (and even of burning the skin) which might follow the custom of putting a child with a fit into a hot bath. He asked how one was to treat the akinetic seizures of toddlers; Dr. P. R. EVANS (London) said that at Johns Hopkins Hospital ketogenic diets were used successfully. Dr. Evans questioned the value of phenobarbitone in petit mal, and Dr. JOHN LORBER (Sheffield) said that he had scored some striking successes by stopping the drug in such cases. Mr. Gillingham had advocated the use of heparin for cerebral thrombosis, but Dr. H. G. GARLAND (Leeds) thought that the haemorrhage which often occurred in these cases contra-indicated anticoagulants. Dr. H. R. E. WALLIS (Bath) was assured by Dr. POND that amphetamine was indeed useful for children who had temper tantrums, whether or not they also had epilepsy. Opinion was divided about the necessity of doing blood counts when diones were used, although it might be worth doing for medico-legal reasons; Dr. WALLIS and Dr. BERNARD E. SCHLESINGER (London) had seen type 2 nephritis follow the use of tridione. Professor O. V. JOOMA (Karachi) found epilepsy following brain abscess easy to control with anticonvulsants and doubted whether extensive surgery was justified. All in all the discussion revealed much interest and many fields of ignorance in our views on epilepsy. Dr. Davidson in his opening paper stressed our need to learn more, especially of pathology, and speaking of the unfortunate parents of these children, he quoted Emerson: "Knowledge is the antidote to fear."

SECTIONS OF MICROBIOLOGY AND PATHOLOGY, AND PREVENTIVE MEDICINE AND INFECTIOUS DISEASES

Wednesday, July 7

Poliomyelitis

Under the joint chairmanship of Professor D. F. CAPPELL (Glasgow), president of the Section of Microbiology and Pathology, and Dr. T. ANDERSON (Glasgow), president of the Section of Preventive Medicine and Infectious Diseases, a discussion on poliomyelitis was opened with a paper written by Dr. A. P. GOFFE (London) and read in his absence by Dr. G. L. LE BOUVIER (London) on recent advances in knowledge of the virus. He said that the virus was one of the smallest viruses known. Type II had been adapted to rodents, and more recently Types I and III had also been adapted to mice, the infection being transmitted by the intraspinal route. The fact that the virus could be grown on tissue cultures of non-nervous tissues suggested that it might not be so exclusively neurotropic as was formerly thought. There appeared to be no relation between the virus type and clinical severity. In both America and Europe Type I was commonest, and during the last few years Type II had been rather more common in Britain than in the rest of Europe.

Route of Infection

The usual route of infection could be assumed to be by mouth, and thereafter the virus multiplied in the cells of the alimentary tract and neighbouring tissues. In a proportion of people this stage was followed by systemic invasion, and later by invasion of the central nervous system. In monkeys the stage of viraema terminated with the appearance of the antibodies in the blood. Excretion of the virus continued for a variable period; it might occasionally last for several weeks, but true chronic carriers had not been found.

Search for virus and antibodies in groups of the population had shown the inspection rate to be much higher than the case rate, and that the infection rate was higher in the poorer classes. The virus had been found in sewage when recognized cases were not occurring. The finding that there was a high rate of infection in close contacts of known cases had been confirmed by virological studies in this country within the past year. Dr. Le Bouvier concluded by stating that many contacts of cases continued to excrete the virus after three weeks; this suggested that the effect of quarantine measures should not be regarded too optimistically.

Epidemiology of Poliomyelitis

Dr. W. H. BRADLEY (London) said that not enough facts had been marshalled to justify a firm theory of the epidemiology of the disease, but in the meantime the public health worker must be told what control measures were practicable and worth while. Communicability was most marked at the onset of the disease, and might be considerable up to three weeks later. In addition to specific immunity in the host, several non-specific factors—including prophylactic and therapeutic injections and the operation of tonsillectomy—had to be considered, although none of them appeared to be numerically important. It was not yet possible to establish a correlation between levels of antibody in the blood and resistance to poliomyelitis virus.

Dr. Bradley stated that the theory that the virus of poliomyelitis was widely distributed during epidemics rested largely on the results of surveys of antibody in the blood of population groups. Although the findings in these surveys often corresponded with the known facts of the occurrence and age distribution of poliomyelitis in the community, this was not invariably so. By studying the manner in which the disease behaved in this country, he was led towards the theory of limited selective distribution of the virus in the community. He had found poliomyelitis to be a "place" disease, spreading in a chain pattern which was influenced by geographical and social barriers. The increased incidence since 1947 was due to the greater frequency of outbreaks and not to increased infectivity. Incidence among listed contacts of a case was immeasurably higher than in the general population, and the period of infectivity appeared to be generally brief, coinciding with the time when the virus was present both in the pharynx and in the intestines.

The theory of limited selective distribution was supported by the finding that the virus was recovered much more often from close household contacts than from non-familial contacts, and comparatively infrequently from the general public. Dr. Bradley concluded with a plea for the wider use of surveillance and for modified quarantine measures applied to the close contacts of cases.

Treatment of Respiratory Failure

Dr. A. B. CHRISTIE (Liverpool), in a paper on the treatment of respiratory failure in the acute case, said that many factors were involved in the production of respiratory distress. The two primary principles of treatment were that when the respiratory muscles were weakened they must be mechanically assisted, and when the airway was obstructed it must be cleared. But the application of these principles gave rise to baffling problems. In the diagnosis of respiratory paralysis the physician should not be misled by apparent paralysis in which the real trouble was in the pharynx. The cause of obstruction of the airway must be determined if suitable treatment was to be given. It might lie in pharyngeal paralysis, paralysis of the tongue, or in accumulation of secretions in the air passages from inability to cough. The respiratory centre might be damaged by the virus or by oedema of the brain, or it might be affected by variations in oxygen and carbon dioxide concentration. Anoxia from any of these causes could lead to oedema of the pulmonary epithelium, which, by impeding gaseous exchange and decreasing the elasticity of the lungs, would further increase anoxia. Artificial respiration might impede the return of venous blood to the heart and lead to a fall in cardiac output, as in shock. But shock might also result from involvement of the cerebral centres.

The background to the clinical picture was therefore very complex, and unless the exact reason for a particular symptom was discovered errors in treatment might result. Anoxia was often accompanied by carbon dioxide retention, and the relief of anoxia alone could not lead to clinical improvement.

Dr. Christie emphasized that there were problems in respiratory failure for the clinician, the physiologist, the pharmacologist, the pathologist, and the virologist, and at the bedside it was essential to have co-operation between physician, anaesthetist, surgeon, and pathologist.

Practicability of Virus Studies

An interesting discussion on the opening papers then took place. Professor J. W. HOWIE (Glasgow) said that he would like to have known what were the results of quarantine when it had been applied. Professor ROBERT CRUICKSHANK (London) thought that it would be impracticable to use virological findings to determine such matters as the period of stay in hospital, and Dr. S. I. A. LAIDLAW (Glasgow) spoke of the difficulty of finding hospital accommodation if all those excreting the virus were to be isolated. A number of speakers, including Dr. JOAN TAYLOR (London), Dr. E. N. REID (Stirling), and Dr. G. I. WATSON (Surrey), asked about the practicability of virus studies in clinical and field work, but Dr. LE BOUVIER stated that at the moment virology was available only for specific research projects. Dr. WATSON described an outbreak of pyrexial infection in his practice and stressed the potential value of the general practitioner in research on such subjects. Dr. A. R. SOUTHWOOD (South Australia) gave a summary of recent epidemics in Australia, and stated that it would be very rash to prophesy about the future. He felt that, although personal contact could often be demonstrated, subclinical attacks were so frequent that there would be many leakages in any system of quarantine. He asked whether tracheotomy had a place in treatment, and Dr. CHRISTIE said that the only definite indication was when paralysis of the pharynx occurred together with paralysis of the chest wall.

Professor JOSEPH TRUETA (Oxford) said that infection with poliomyelitis virus was unimportant if it were not for involvement of the nervous system. He was carrying out research into the relation between muscle trauma and vascular changes in the spinal cord. A number of speakers, including Dr. A. B. KINNIER WILSON (London), Dr. H. STANLEY BANKS (London), Dr. J. F. GALPINE (Coventry), and Dr. JAMES MACRAE (Bristol), discussed methods of transporting patients with respiratory paralysis, and the need for special centres for the treatment of these patients.

Dr. J. B. S. MORGAN (Derby) and Dr. I. B. L. WEIR (Dundee) asked if gamma globulin could be used in control. Dr. LE BOUVIER said that although some trials had been successful others had not been so impressive, and there were practical supply difficulties which prevented its widespread use.

The discussion was concluded by Dr. T. ANDERSON, who said that it was important to realize that poliomyelitis could behave in a different manner in different districts and types of community. He thought that the history of infectious diseases had shown that attempts at quarantine of the common infections had proved quite valueless. His view of the epidemiology of poliomyelitis lay somewhere between the broad- and narrow-stream hypotheses.

SECTION OF PREVENTIVE MEDICINE AND INFECTIOUS DISEASES

Thursday, July 8

The Epidemiology of Non-infectious Diseases

With the president, Dr. T. ANDERSON (Glasgow), in the chair Dr. J. N. MORRIS (London) opened a discussion on the epidemiology of non-infectious diseases. The middle-aged male, he said, provided the major challenge to public health in the Western world. The mortality of males of this age had fallen less than that of females between the wars, the difference between the sexes being largely due to an increased number of male deaths from carcinoma of the lung and coronary thrombosis, which were the "modern epidemic diseases."

The epidemiological method could be used to estimate the risk of contracting different diseases in various groups of

the population. It was a function of epidemiology to show the dimensions, distribution, and relative importance of community health problems, to throw light on groups of diseases requiring more attention, and to indicate vulnerable groups of the population. Dr. Morris gave examples of group studies of coronary thrombosis and other diseases which had led to the discovery of possible aetiological factors. The epidemiological method could also be used more extensively than at present in operational research into the functioning of the National Health Service, in finding out what the Service should be doing and how well it was doing it.

There was to-day a great opportunity for the medical officer of health to carry out epidemiological research. Great social changes were taking place, and the effect of these changes on the health of the community must be studied. The medical officer of health was not at present taking advantage of his opportunities to re-establish relationship with the clinicians. Epidemiological studies of the changing problems of our changing society would have a tonic effect on the whole of medicine by emphasizing causes and prevention as opposed to the mere phenomena of disease.

The Epidemiology of Old Age

Dr. W. FERGUSON ANDERSON (Glasgow) spoke of the epidemiology of old age. He gave figures showing the increase in the numbers of old people in Scotland, in the United States, and in other parts of the world. Climate appeared to be one of the factors affecting longevity, a warm climate being favourable. Heredity was an important influence, both short-lived and long-lived families being well known. The results of twin studies showed that heredity also affected the age at which a person tended to become old. Nutrition played a part in determining the number of persons reaching old age, mortality being excessive in those who were overweight. It had also been shown that a good home environment favoured longevity. There had been an increase in the amount of unemployment in old people in the last half century, this being a regrettable tendency in view of the fact that unemployment and poverty increased the death rate, whereas muscular exercise did not prevent people from living long lives. Dr. Anderson ended with a plea for the education of doctors and relatives in the necessity of keeping old people active, interested, and on their feet rather than in their beds.

Epidemiological Approach to Obstetric Medicine

Dr. A. M. THOMSON (Aberdeen) said that he found the epidemiological approach to obstetric medicine useful in providing insight into the nature of conditions which could not be fully understood by study of the individual case. Epidemiological research in a clinical unit increased the precision of clinical observation, improved the quality of case records, suggested fruitful lines of laboratory research, and provided the means of checking the results of treatment.

In a series of stillbirths and first-week deaths studied at Aberdeen Maternity Hospital over a period of fifteen years, 13.7% of the babies were mature, and the underlying cause of death, which was usually anoxic in nature, was unknown. The death rate was relatively high in the babies of the older primigravidae, particularly those over 30, and in cases where pregnancy had continued beyond term. There was no correlation with social class or with the physique of the mothers. There were indications that foetal distress was more frequent in post-maturity, and this was confirmed by statistical analysis. As a result of these observations an attempt was being made to reduce mortality by routine induction of labour at or near term in primigravidae aged 25 or over, and by more frequent resort to caesarean section when foetal distress occurred during labour. Laboratory studies had shown that the excess of mortality and foetal distress in post-maturity was associated with progressively falling levels of oxygen in foetal blood in pregnancies which did not end at term.

The Role of the Medical Officer of Health

Dr. JOHN RIDDELL (Edinburgh), speaking on the work of the medical officer of health, said that he was concerned both with the health of the individual and with the health of the community, and it was his duty to keep himself advised of any factors reacting adversely on these. He must therefore not only be conversant with other research results but undertake research himself. The medical officer of health possessed in his records information not included in clinical records, and in the health visitor he had a trained worker who was familiar with the social and environmental conditions of families in his area. Thus with the information provided by consultants and family doctors he was in a position to compile a comprehensive dossier. He gave examples of current investigations which could not have been carried out without the assistance of the medical officer of health, and suggested that more use should be made of school and maternity and child welfare records. Research usually involved team-work, and even the medical officers of small areas could combine in local and national surveys. A major national problem was the necessity to increase productivity, and Dr. Riddell suggested that further inquiry should be made into absenteeism from work owing to sickness. The list of main illnesses causing loss of working time differed from the list of the principal killing diseases.

The medical officer of health had a duty to act as an information bureau disseminating the results of current research. Putting the results of research into practice in the public health field involved further continuous research by trial and error. It was a mistake for health departments to concentrate on the sociological aspects of research to the exclusion of the medical aspects. The key to success was the inquiring mind, and co-operation between the family doctor, the hospital, and the medical officer of health would lead to an extension of knowledge.

In the subsequent discussion Dr. R. SUTHERLAND (Leeds) said that environmental studies were not enough, and that more research was needed into constitutional factors in disease. Dr. E. N. REID (Stirling) felt the need for readier access by the medical officer of health to morbidity data from general practitioners and hospitals. Dr. S. I. A. LAIDLAW (Glasgow) looked forward to closer co-operation between the clinical and preventive services. He thought that too much money was spent on the clinical services and too little on prevention, but Dr. MORRIS pointed out that it was important to show exactly how additional money for preventive work could best be used.

The CHAIRMAN, bringing the meeting to a close, said that discussion had shown the epidemiological method to have two aspects. The first was the analysis of data already available, and the other was the forward-looking approach in which the health worker decided what information he wished to obtain on a particular problem and devised his own methods of obtaining it.

THE SCIENTIFIC EXHIBITION

A DIVERSE DISPLAY

The Scientific Exhibition, now an important feature of the Annual Meeting, has gone from strength to strength in the three years which have elapsed since the first Exhibition at Dublin. This year at Glasgow there were 36 stands as well as four special exhibitions. There was still a tendency to overcrowd the small shop window that each stand provided and to overwhelm the visitor with too great a mass of material. This failing was the more obvious for seeing how some exhibitors had avoided this pitfall. In this respect the demonstration by the Nuffield Department of Clinical Medicine, Oxford University, of the stomach in megaloblastic anaemia, and the illustration of medical diseases complicating pregnancy by the National Maternity Hospital, Dublin, were exemplary. Also well-ordered were the illus-

trations of eye changes in vascular disease presented by the department of ophthalmology, University of Glasgow; the diagnostic survey of the infertile marriage set out by the Royal Samaritan Hospital for Women and the Royal Infirmary, Glasgow; the approach to the diagnosis of brain tumours depicted by the Manchester Royal Infirmary departments of medical art, medical photography, neuroradiology, and neurosurgery; and the lucid exposition of some mycotic infections of the smooth skin and nails by the department of dermatology, Leeds General Infirmary.

Cancer

The Royal Cancer Hospital, London, illustrated the natural history, diagnosis, and treatment of cancer of the breast so graphically and so convincingly that the visitor could hardly fail to remember the lessons to be learned at this stand. Of topical interest was the mechanical apparatus for smoking cigarettes shown by the cancer research department of the Royal Beatson Memorial Hospital, Glasgow, whose other exhibits related to atmospheric pollution by known and suspected carcinogens, and to the experimental induction of liver tumours in rats.

In the field of psychological medicine the tests shown by the department of psychological research, Crichton Royal Hospital, Dumfries, tempted many a visitor to stop for self-analysis and to try his hand at solving problems. There was also a photographic record of the work and research being done in the department of child psychiatry of the same hospital. Also of paediatric interest was the demonstration from the Department of Child Health, Sheffield University, of the results of treatment of tuberculous meningitis in children. The photographs of the children before and after the treatment were most convincing.

Surgery and Medicine

Surgical subjects were relatively few, but all were scrupulously documented. The causes and treatment of portal hypertension, with models of the steps of porto-caval anastomosis, were set out by St. Bartholomew's Hospital and the Royal Cancer Hospital, London. The Royal Infirmary, Glasgow, detailed the investigation and surgical treatment of mitral disease; and the urological departments of the Victoria Infirmary, Glasgow, and Hairmyres Hospital, Lanarkshire, illustrated the treatment of prostatic obstruction by punch resection, cases of carcinoma of the bladder, and varieties of aberrant ureter in the female. The Nuffield Orthopaedic Centre, Oxford University, portrayed the aetiopathology of osteoarthritis of the hip and the clinical characteristics of scoliosis. The Glasgow Royal Infirmary together with the Institute of Physiology, Glasgow University, showed a standard apparatus for hand-venous-occlusion plethysmography adapted for use during surgical anaesthesia, together with an analysis of the results obtained with it.

Among the medical subjects, departments from the Universities of Edinburgh, Glasgow, and Sheffield combined to illustrate the use of radioactive iodine in medicine, especially in relation to diseases of the thyroid. Radioactive iodine studies in familial cretinism were demonstrated by the department of child health, Glasgow University, and the Hospital for Sick Children, Glasgow, which also displayed the results of A.C.T.H. and cortisone treatment in nephrosis, and the details of 60 fatal cases of fibrocystic disease of the pancreas. Also from Glasgow University and the departments of pathology and surgery at the Royal Infirmary were presentations of the pathology and clinical aspects of phaeochromocytoma; the effect of A.C.T.H. and cortisone on the repair of lesions in experimental animals; and pituitary and adrenal changes after stress in man and animals. The pathology department, Glasgow Western Infirmary, contributed studies on iron metabolism in man and animals illustrated by excellent colour photographs. Present-day concepts of certain mechanisms of allergy and their relationship to clinical testing were presented by the Wright–Fleming Institute of Microbiology, St. Mary's Hospital Medical School. The mystery of "The Skeleton in Lactation" was solved by the Rowett Research Institute, Bucksburn, Scotland, which showed the effects of lactation on mineral loss from the different bones of the skeleton.

The Services and Public Health Departments

For the technically minded there was much to see and study. The Royal Air Force Medical Directorate showed apparatus designed and developed by the electronics laboratory at Chessington for electrodiagnosis and electrotherapy. The Royal Navy Medical Directorate demonstrated life-saving equipment, and clothing designed to protect against cold and wet. The Royal Army Medical Corps, however, presented a clinical subject, giving a comprehensive account of mite-borne (scrub) typhus. Other technical equipment included apparatus for electroencephalography set out by the Department of Psychological Medicine, King's College Medical School, Newcastle-upon-Tyne, in conjunction with the biophysics unit, Crichton Royal Hospital. The National Coal Board Medical Service illustrated research being carried out at Oxford and Cambridge Universities into the effects of hot and humid conditions. And the British European Airways Medical Service showed the organization behind, and the medical aspects of, their Highlands and Islands Ambulance Service.

In the field of public health, the Food Hygiene Laboratory, Central Public Health Laboratory, Colindale, reminded visitors that despite the weather it was officially summer, by devoting their stand to the epidemiology, laboratory management, and control of bacterial food-poisoning and other food-borne disease. Glasgow University and City combined to review the laboratory and statistical aspects of acute respiratory disease in Glasgow during the last 25 years. The Department of Health for Scotland portrayed the changes in the health of the population of the country over a period of years; and the Scottish National Blood Transfusion Association demonstrated all stages of the production of blood derivatives from the initial bleeding of the donor to the separation of the various fractions of plasma and their clinical use.

Special Exhibitions

There were four special exhibitions this year. The Pharmaceutical Society of Great Britain, in a display entitled "The Pharmacy of Large Molecules, Ancient and Modern," made a difficult subject look fairly simple with the help of charts, diagrams, and models. The Ministry of Labour and National Service demonstrated the various services for the rehabilitation and resettlement of the disabled. This was in addition to a stand devoted to the scope of rehabilitation by the Rehabilitation Committee of the B.M.A. which was included in the main scientific exhibition.

The Royal Faculty of Physicians and Surgeons of Glasgow had arranged an impressive and informative exhibition entitled "Glasgow in the History of Medicine." Against a background of cards giving the dates of the main events in world history the history of medicine was illustrated by rare manuscripts and books from the Royal Faculty's library, Hippocrates, Galen, Rhazes, Avicenna, Paracelsus, Paré, Vesalius, Jenner, and John and William Hunter being among the authors represented in this remarkable collection. Also included in this display were a number of interesting relics of renowned Glasgow medical men and some early minute books, including the first minute book of the Faculty, dating back to 1599.

Among the surgical instruments on display were those of David Livingstone and of William Beatty, surgeon in the *Victory* at the Battle of Trafalgar. Among the Lister relics were his carbolic spray and some tin candlesticks from one of the theatres in which he operated. The first instru-

ment sterilizer used in this country—it was designed by William Macewen—looked remarkably similar to its modern counterparts.

ONE HUNDRED YEARS OF MEDICAL PHOTOGRAPHY

The Medical Group of the Royal Photographic Society, now nearly 300 strong, provided an admirable stand in the Kelvin Hall on the general theme of the changes in medical photography over the last 100 years. There were a dozen mounted displays comparing the early technical achievements with modern work. The displays dealt with the photography of patients and gross specimens, photomacrography and photomicrography, retinal photographs, and special techniques, such as endoscopic photography. Then came a panel illustrating the work of the hospital photographic department, and others giving details of the apparatus and materials used in medical photography. Commenting on the standard of the early photomicrographs, the Medical Group say that those done in the 1880s were equal in many respects to those taken now. The first reasonable picture of a retina was made as long ago as 1891. This interesting and informative exhibit was the work of Peter Cardew, Peter Hansell, F. E. McAdoo, K. G. Moreman, and R. G. W. Ollerenshaw.

Correspondence

Cortisone and Aspirin in Rheumatoid Arthritis

SIR,—In their letter (*Journal*, June 26, p. 1499), Dr. G. E. Loxton and Mr. D. Le Vay write as if the results of the trial conducted by the Medical Research Council and Nuffield Foundation (*Journal*, May 29, p. 1223) were presented and judged wholly, or mainly, in terms of percentage changes over the year. In fact, the mean absolute values of the measurements in each treatment group are given at week 0 and the subsequent changes in these values at week 1 and between week 1 and week 8, and week 8 and 1 year. Judgment can be based—and indeed was mainly based—upon these absolute values. In the two treatment groups they ran a closely parallel course in all the recorded characteristics except the haemoglobin level and blood sedimentation rate. Hence the carefully worded conclusion that "for practical purposes . . . there appears to have been surprisingly little to choose between cortisone and aspirin in the management of these 61 patients in the early stages of rheumatoid arthritis."

Percentage changes were likely to be more informative in two measurements only—the range of wrist movement and the strength of grip—for in these the cortisone group happened to have an initial advantage. Dr. Loxton and Mr. Le Vay take the trouble to point out that such a percentage change, when based upon the initial values, would be nonsense if some entirely different and unreal circumstances prevailed. We do not deny it, and in the absence of such extreme circumstances the point is academic. They then maintain that the observed change must be measured in terms of the total change that is "possible up to an arbitrary standard of normality." For example, they postulate an "arbitrary normal" of 130° for range of wrist movement. They proceed to use this in relation to the *average* changes that were shown in the report for each treatment group. But this application entirely overlooks the fact that many individual values contributing to these averages actually exceeded their arbitrary normal of 130°—that is, the patients achieved the "impossible." But if the method is to be adopted it must be applicable to each individual patient. In such circumstances we can, it seems, allow the patient to improve up to 130°—that is, by 100%, but, clearly, by no more. The "impossible" excess we must, by definition, ignore. We have made such a calculation for each patient and find that on this basis the average improvement in range of wrist movement would be 41% in the cortisone group and 40% in the aspirin group. If we advance the "normal" to 140° the relative average changes become 36% and 37%, and if we advance it successively to 150°, 160°, and 170° the difference between the two groups is still negligible in every case—which is the conclusion we originally reached.

Even if this method put forward by Dr. Loxton and Mr. Le Vay were correct, and correctly applied, we would not accept the results of applying a test of significance to a series of differences which are likely to be correlated with one another—for example, strength of grip of left and right hands. We would also dissent from them wholly in their assertion that "the results of clinical trials are only useful and worth reporting when they destroy the null hypothesis." We believe this to be a doctrine false to all scientific reasoning.—I am, etc.,

Manchester. J. H. KELLGREN.

Tropical Diseases in Britain

SIR,—Some of the statements made by Dr. C. F. J. Cropper in his letter (*Journal*, July 3, p. 46) are so inaccurate that they cannot be allowed to stand. Thus he remarks that I express "strong disagreement with the idea of diagnosing chronic amoebic dysentery by sigmoidoscopy." In fact the relevant portion of my paper reads: "Sigmoidoscopy is occasionally helpful, but it is remarkable how seldom it affords positive evidence of the disease in cases in which the diagnosis has not already been proved by stool examination. It is, of course, of great value in distinguishing ulcerative colitis or neoplasms of the bowel from dysentery, and negative sigmoidoscopic findings also assist in excluding organic disease." Surely "strong disagreement" is an exaggerated description.

A gross inaccuracy is contained in Dr. Cropper's statement that I dismiss "the pin-point crater" as "a normal anatomical structure." I do not even mention pin-point craters; the portion of my paper to which he refers is: "An increasing number of observers are becoming sceptical of small pits in the bowel mucosa as evidence of previous amoebic infection. These received much publicity towards the end of the second world war and were supposed to be the scars of amoebic ulcers. Such ulcers, however, unless of great size, normally heal and their scars completely disappear." These lesions have been referred to by Dr. Cropper[1] as "healed amoebic ulcers" which appear in some successfully treated cases as "slightly depressed glistening areas where the original ulcers existed. They are yellowish pink and devoid of mucus glands." I purposely avoided discussing "pin-point craters," for evidence of their being of amoebic origin is not proved, but is, as Dr. Cropper states, "presumptive."—I am, etc.,

London, N.W.1 A. W. WOODRUFF.

REFERENCE

1 *Lancet*, 1945, 2, 460.

Diagnosis of Pernicious Anaemia in General Practice

SIR,—I read Dr. J. F. Wilkinson's article (*Journal*, June 12, p. 1370) on hyperchromic anaemias in the "Clinical Pathology in General Practice" series with great interest, but I cannot help feeling that this stresses the present deplorable tendency—that "this case is too difficult for the G.P., so send it to the nearest hospital."

Dr. Wilkinson stresses in his opening sentence that an anaemic patient should have (at least) a blood count and a bone-marrow biopsy; with the first suggestion I agree heartily, but the second is surely an unnecessary complication in many cases. Over the past eight years in a moderate-sized practice I have personally diagnosed nine cases of pernicious anaemia, and I fail to see how a bone-marrow biopsy would have helped.

With a suspected anaemia, I first take a haemoglobin estimation and add this result to my clinical assessment of the case. If I feel that there are any indications for any treatment apart from iron, I take a blood film and do a red-cell count. For the vast majority of the cases these latter tests will not be required, but they will indicate whether or not I am dealing with a hyperchromic anaemia.

If they do, I carry out daily reticulocyte estimations (wet film) whilst giving 100 μg. of B_{12} daily by injection. If there is no reticulocyte response by the fifth day I reassess the condition. The reticulocytosis which starts on the third or fourth day of treatment and which usually subsides rapidly after the ninth or tenth day can be estimated in less than two minutes, and its appearance gives great pleasure to one who still (in spite of much discouragement) likes to think that even if a G.P. is a part-time clerk he should also be a part-time physician.—I am, etc.,

Stoke-on-Trent. P. R. BRADWELL.

Clinical and Chemical Studies in Human Lactation

SIR,—Part VII of Dr. F. E. Hytten's paper (*Journal*, June 19, p. 1410) is notable for the misrepresentations of the work of others. He criticizes two books[1 2] for suggesting that breast-fed babies need additional vitamins, because he says that the evidence is slender that there is a vitamin deficiency in breast milk. He goes on to make some totally incorrect references to my book. He quotes a statement on p. 54 of my book,[3] to the effect that a baby should not be taken off the breast because the mother or someone else says that the breast-milk looks watery, as evidence that I state that lactation never fails, and goes on to say: "In confirmation of this claim Illingworth quotes the following authors . . ." mentioning two authors, to whom I referred on p. 3 of my book, 51 pages earlier, in an entirely different connexion.

Hytten proceeds to criticize other authors for belief in "the universal ability to breast-feed," in the light of evidence in his paper that some women cannot breast-feed their babies—a fact known hundreds of years before Hytten's paper was published. Anyway, the authors criticized never suggested in their papers that all women could breast-feed their babies. Jeans and Marriott, for instance, "make the categorical statement that breast-feeding is possible for at least the first few months in over 85% of cases." Is that regarded by Hytten as "universal"?—I am, etc.,

Sheffield, 10. R. S. ILLINGWORTH.

REFERENCES

1 Naish, F. C. (1948). *Breast Feeding*. Oxford University Press, London.
2 Jeans, P. C., and Marriott, W. McK. (1947). *Infant Nutrition*. Mosby Company, St. Louis.
3 *The Normal Child*, 1953. Churchill, London.

Psychiatry and General Medicine

SIR,—The letter from "Medical Practitioner, West Africa" (*Journal*, June 26, p. 1495) discussing the association between malaria and mental imbalance reminded me of half a dozen cases of severe amoebic dysentery I saw in India during the war years. These men were maniacal when admitted to the ward and required constant observation, yet once the dysentery was under control they became rational and trustworthy. It cannot be a frequent accompaniment of the disease, as these were the only ones affected out of four hundred. They were all seen by the visiting psychiatrist. He had spent many years in India, and told me it was his usual practice to attempt to exclude amoebiasis when investigating a new case of manic depression.

In each case there may be an organic basis for mental disorder. The plugging of the cerebral capillaries seen in fatal cerebral malaria has its counterpart in the rare cerebral abscess of amoebiasis and perhaps in less abundant congregation of amoebae insufficient to lead to abscess formation.

It would be interesting to know how frequently the possibility of amoebiasis is considered in the investigation of manic depression in Britain. A considerable number of the population have suffered from the disease and an even greater number have been exposed to it.—I am, etc.,

Keighley, Yorks. IAN STEWART.

SIR,—I had not intended writing any more on this subject, but the letters of Dr. J. K. Morrice (*Journal*, May 29, p. 1263) and Dr. Michael J. Kennefick (*Journal*, June 26, p. 1495) prompt me to ask for a little more of your space. I have always believed that the *Journal* which you edit acts as a useful forum for the airing of opinions, and was disappointed that my criticisms (*Journal*, May 8, p. 1096) should arouse only resentment and a plea not to throw stones. Rather did I hope that my challenge would be met with bold answers, showing me where I was misinformed.

I am old-fashioned enough to believe that the criteria of assessing successful treatment are the improvements made by patients, and Dr. Morrice has not convinced me of the falsity of this belief. I made a plea for more prominence to be attached to the question of *treatment* of psychiatric cases, and I cannot believe that calling some of my patients hypochondriacs, rather than anxiety neuroses, is much help to them even if it pleases Dr. Kennefick. I would assure both doctors that my views as expressed in your columns are not passed on to my patients.

I have been asked not to throw stones, so I must try not to weaken the armour of our colleagues. Henceforth the stones will belong to the subconscious—though I shudder to think what future symptoms the psychiatrists will ascribe to my "subconscious calculi."—I am, etc.,

London, S.E.24. CYRIL JOSEPHS.

Mondor's Disease

SIR,—We have been grateful to your correspondents who have contributed other examples of the condition we described (*Journal*, May 8, p. 1074). The fact that two current cases were recorded suggests that it may not after all be so very uncommon. It is interesting that most of your correspondents' cases were males. We were aware from the literature that it occurred in men, but stated that it was more common in females. Our patients happened all to have been women. Since our paper was submitted there has been an article by Dr. Parkes Weber,[1] and correspondence subsequently from Mr. R. H. O. B. Robinson[2] and Sir Henry Tidy[3] concerning forms of phlebitis apparently related to Mondor's disease, and presumably also to the antecubital phlebitis present in Dr. Harwood Stevenson's second case (*Journal*, May 22, p. 1207).—We are, etc.,

G. M. LUNN.
Oxford. J. M. POTTER.

REFERENCES

1 *Lancet*, 1954, **1**, 131.
2 Ibid., 1954, **1**, 217.
3 Ibid., 1954, **1**, 262.

Heat-resisting Silicone-rubber Seals

SIR,—Dry heat sterilization of laboratory glassware (180° C. for one hour) is often more convenient than autoclaving, for the following reasons: (1) it is simpler; (2) a thermostatically controlled oven can be used continuously as both a sterilizer and store cupboard for the glassware, which is always available in a dry state; and (3) there is not the risk, sometimes associated with the use of the autoclave by the inexperienced, of a breakdown in the drill, leading to inadequate sterilization. However, containers intended for the receipt of sterile solutions or sterile biological materials require lids which are usually of the screw-cap type fitted with a rubber disk to make an airtight seal, as, for example, in the various types of "universal" containers and transfusion bottles. In the past this has precluded the use of dry heat sterilization, since ordinary rubber perishes at the temperature required. Nowadays this difficulty can be overcome by the use of silicone-rubber for the sealing disks, as it will withstand temperatures of 180° C. without losing its rubber-like properties.

We have used such rubber sealers for several laboratory purposes with complete satisfaction and can recommend their routine adoption in circumstances where dry heat sterilization is indicated. We have made them by cutting disks with large-size cork-borers from $\frac{1}{4}$-in. (3.2-mm.) silicone-rubber sheet ("silastomer," Midland Silicones Ltd.)

obtained from the Dunlop Rubber Company Ltd., Cambridge Street, Manchester, 1. The sealers have been found satisfactory for sealing screw-cap containers and for piercing repeatedly with serum needles for withdrawal of contents with a syringe. In these respects "silastomer" rubber seems at least as good as ordinary rubber, and we have noted no deterioration after repeated re-heating to 180° C. for as long as 100 hours. We have tested the porosity of the rubber to air and bacteria before and after such heat treatment and found it to retain its properties as an efficient seal. It was not permeable, either before or after heating, when exposed for a period of seven days to a growth of *Serratia marcescens* under slight positive pressure. We have also investigated the possibility that the rubber might have an inhibitory effect on bacterial growth and found that it does not inhibit the growth of minimal infecting doses of *Staphylococcus aureus, Escherichia coli, Bacillus anthracis, Clostridium sporogenes,* and *Cl. tetani,* nor does it delay germination of spores of the last three species.

At present prices, when the rubber sheeting is bought in small quantities, disks for the screw-caps of "universal containers" cost 3s. 8d. per dozen. It is perhaps worth noting that "silastomer" rubber tubing can also be sterilized by dry heat in the same way as the sheet rubber.—We are, etc.,

R. C. NAIRN.
K. B. FRASER.

Aberdeen.

Intra-arterial Therapy in Occlusive Vascular Disease

SIR,—In the article by Mr. J. Woodrow Betts (*Journal,* June 12, p. 1360) it was concluded that intra-arterial tolazoline ("priscol") did not relieve intermittent claudication due to occlusive vascular disease.

These findings do not accord with my experience in a small series of 13 cases, where complete relief of symptoms was obtained in four cases and a definite improvement in a further five. Twelve of these cases were too infirm to stand sympathectomy, and nine of them were classified as Stage 3 according to Boyd *et al.*[1] Three of the cases had relapsed after a previously effective sympathectomy and two of these improved after the injections. After three to five months several subjects relapsed, but quite a high proportion of these cases improved again after another course of injections.

The object of writing this letter is to prevent the use of intra-arterial injections of tolazoline being lost sight of as a useful means of relieving symptoms of intermittent claudication. It is safe, easy to perform at out-patients, and well tolerated.

My experience with cases of ischaemic necrosis is also very satisfactory and confirms the work of Betts and Edwards *et al.*[2] Of ten cases which were deteriorating under conservative treatment and antibiotics, the ulcer healed in seven, and by its use the amputation of several legs was prevented. I would advocate that intra-arterial injections of vasodilators should be used as routine in this condition.—I am, etc.,

H. A. W. FORBES.

Plymouth.

REFERENCES

1 *J. Bone Jt Surg.*, 1949, **31B**, 325.
2 *British Medical Journal,* 1952, **2**, 808.

Heart Failure and Phenylbutazone

SIR,—Dr. H. A. Reid's letter (*Journal,* May 22, p. 1209) is timely, reminding us that phenylbutazone should not be given to patients with heart disorders. From the start we have been taught by Currie[1] (who introduced it) and other pioneers[2 3 4] that patients should be carefully selected. Nearly every recorded tragedy has been due to one of these reasons: (1) The patient was too old or had cardio-reno-vascular, alimentary, or nervous disorders. (2) Dosage was excessive. (3) Treatment was continued after complications had appeared.

(1) Calculated risks cannot be taken with phenylbutazone. If treatment is effective it must be pursued for months, and old, hypertensive, or sick people may be embarrassed by fluid retention.[5 6] I seldom give it to people over 65; nearly a year ago three aged patients (out of 670) died from heart failure a few weeks after starting treatment. When an old patient dies as if from natural causes[7 8] we should take warning.

(2) The optimal blood concentration can be achieved with 800 mg. in one day,[1] or 600 mg. daily for three days,[7] or 400 mg. for a week.[9] And it can be maintained with still smaller doses. Its therapeutic effects, too, are obtained by the same doses, and maintained by 200 or 300 mg. daily, often tapering off to once or twice a week.[1 10 11 12] I have 109 patients taking phenylbutazone for more than a year; nearly half are taking a small dose every second, third, or fourth day. Toxic effects are nearly twice as common after two or three weeks on 600 mg. daily as on 400 mg. or less.[13] They are more common with a high than with a low blood level.[7] Phenylbutazone at the optimal level is slowly metabolized; above this it is rapidly converted into its toxic metabolic products.[9] Prolonged dosage above 400 mg. daily—as recently advocated[6 8]—is therefore harmful.

(3) The dangerous toxic effects should be listed for the patient, who is instructed to stop treatment as soon as they appear. In most cases they subside within a few days. After all except cardiovascular and severe gastro-intestinal complications treatment may be resumed later. But to continue treatment during acute toxic episodes is to invite trouble.

Phenylbutazone is safe under these rules if the patient is watched during the first five weeks, when most complications appear.[11 13] After this the effects of the small maintenance dose may be observed every month.—I am, etc.,

MICHAEL KELLY.

Melbourne.

REFERENCES

1 Currie, J. P., *et al.* (1953). *Ann. rheum. Dis.*, **12**, 88.
2 Hart, F. D. (1953). *Practitioner*, **171**, 84.
3 Davies, H. Rhys, *et al.* (1952). *British Medical Journal*, **2**, 1392.
4 Kuzell, W. C., *et al.* (1952). *J. Amer. med. Ass.*, **149**, 729.
5 Mason, R. M. (1954). *British Medical Journal*, **1**, 788.
6 Pemberton, M. (1954). Ibid., **1**, 490.
7 Bruck, E., *et al.* (1954). *Lancet*, **1**, 225.
8 Arden, G. P. (1954). *Rheumatism*, **10**, 44.
9 Burns, J. J., *et al.* (1953). *J. Pharmacol.*, **109**, 346.
10 Newns, G. R. (1953). Empire Rheumatism Council Symposium on Phenylbutazone.
11 Davies, H. Rhys (1954). *Med. ill. (Lond.)*, **8**, 139.
12 Gaudin, G., and Kuzell, W. C. (1953). *Sem. Hôp. Paris*, **29**, 4243.
13 Kelly, M. (1953). *Comm. VIII Internat. Rheumatol. Cong.*, in press.

Fat Embolism

SIR,—Your concise annotation (*Journal,* June 19, p. 1429) does not mention the haemorrhagic and oedematous patches sometimes observed in the retina. Newman[1] states that after he learnt this sign from M. J. F. McArdle he found it positive in each of the last four cases of his series. I have seen these changes widespread in the fundi of a patient who yet showed no skin petechiae.—I am, etc.,

EDMUND SHEPHARD.

London, E.C.1.

REFERENCE

1 *J. Bone Jt Surg.*, 1948, **30B**, 290.

Syme's Amputation

SIR,—I agree with Mr. William Gissane (*Journal,* June 19, p. 1439) in his advocacy of Syme's amputation where practicable for growing children. There is a further point in favour of this procedure which is of overriding importance—namely, the avoidance of the conical overgrowth of tibia and fibula so commonly seen where amputation in a young subject has been done by bone section at a higher level. The pointed end of the bone ulcerates through the skin and re-amputation is usually required, and often has to be repeated as the process continues unless steps are taken to neutralize the epiphysis. Where Syme's has been done in early youth the lady herself can safely be left to decide the cosmetic need for re-amputation when growth is complete, and, as Mr. Gissane implies, the choice is often conservative.—I am, etc.,

D. S. MCKENZIE.

Roehampton, S.W.15.

Ring Incorporated in Finger

SIR,—Dr. J. H. Neame's letter (*Journal*, May 22, p. 1210), describing the unusual case of a ring incorporated in the finger, reminds me of a somewhat similar case which came under my notice, I think in the autumn of 1912, while I was acting as house-surgeon to Sir Crisp English at St. George's Hospital, and although the details are from memory I can guarantee that they are sufficiently accurate.

A rather fat, stupid woman attended the surgery with the proximal portion of the left ring finger much swollen, and at the first glance I took this to be either a chondroma or some form of dactylitis, and when she remarked to me that "the ring was still in" I thought that she was referring to something gynaecological. It appeared, however, that the left ring finger had become swollen for some reason, probably several months before, but she had been able to remove her wedding ring, but the "keeper," which she evidently wore proximal to this, had defied her efforts, and had been left *in situ*. The ring then ulcerated gradually through the skin, which subsequently healed over it. I do not remember the time taken up in this process.

On examination there was a circular scar round the distended part of the finger, this scar being weak and poorly healed on the palmar surface but sound elsewhere, and the skiagram revealed the ring as a broad opaque bar within the finger outline, accurately threaded by the phalanx, which, I think, was unaffected. Under general anaesthesia, a dorsal longitudinal incision revealed a broad ring of gleaming gold, on which the word "Mizpah" was engraved. This was cut through in two places by means of a Gigli saw, and was removed in two halves. The operation is still vivid in my memory. The wound healed, I think, without special difficulty, the swelling of the finger subsiding very slowly, a course of thyroid extract being subsequently employed with much benefit to the mental state of the patient.

I wish to acknowledge my indebtedness to the committee of St. George's Hospital for their permission to narrate in your pages this story of long ago.—I am etc.,

Rustington. W. E. WALLER.

Dental Extractions for Children

SIR,—It may be of interest to your contributors Dr. Herbert W. Swann and Mr. Lawrence B. Weeks (*Journal*, July 3, p. 45) to know that in my experience it has only been found necessary to anaesthetize a young child for dental extractions in its home surroundings on about twenty occasions during the past twenty-five years. Neither in private nor hospital practice should there be any difficulty if the approach to the child is psychologically correct. This means also that the parents must not deceive the child as to what is to happen. A visit to the dental surgeon should be explained as such and not described as a visit to the circus or a trip to watch television.

At the Eastman Dental Hospital this rule is enforced and no treatment is given unless the parents have explained what is to be done to the child beforehand. Using these methods we seldom have any trouble, but when a child is unreasonable "vinesthene" given in an inhaler will produce rapid anaesthesia with a minimum of struggling and psychological upset.—I am, etc.,

London, W.1. VICTOR GOLDMAN.

Prophylactic Penicillin for Minor Casualties

SIR,—My experience of the treatment of minor lacerations such as Dr. G. C. Milner (*Journal*, July 3, p. 46) describes is that, provided the cut is not too filthy, deep, or otherwise complicated, a proper lavage alone is quite sufficient ("cetavlon" is very good). Acriflavine often makes a useful adjunct (and it looks good, too), and in the dirtier wounds penicillin powder, with or without sulphonamide, is definitely valuable. Systemic penicillin is superfluous and quite unnecessary in nearly all such cases. But when it comes to making a 2½-mile (4 km.) journey just to have some stitches out, my sympathies are all with the house-surgeon. How pleasant it is to remove the (original) dressing and rejoice in a neat, cosmetic, soundly healing wound of one's own composition!—I am, etc.,

Hartley Wintney, Hants. H. KELSON FORD.

Nursing-homes

SIR,—The last sentence of the final paragraph of your annotation on nursing-homes (*Journal*, June 12, p. 1368) provokes thought and comment. The long-stay annexes of newly established geriatric units still house large numbers of crippled and enfeebled patients who once existed in public assistance institutions. A few may be enabled to live in welfare homes, but the majority will slowly fade away. The important practical point is that these beds, however released, need never again become blocked for such long periods, since their new occupants are patients who have already been through the rehabilitation wards, where failure to recover sufficiently to leave hospital usually implies that the patient will be dead within six months.

One source from which irremediable patients can still arrive at a geriatric unit is the nursing-home. During the past year I have visited 60 patients in registered nursing-homes. In the majority of cases the request for a visit and transfer to hospital was due solely to the patient's life outlasting her savings. The clinical problems were scarcely considered. Only five of the patients were suitable for rehabilitation, but others would have been had they not elected for a nursing-home at the start of their illness. Except for acute illness, the average nursing-home is not equipped for the potentially rehabilitable elderly patient, but it is admirably suited to the needs of the disabled elderly for whom no further active treatment is possible. I do not wish to decry nursing-homes in any way; they are doing magnificent work for the elderly, and in my own area the understaffed geriatric service would collapse without their assistance. They can continue to fulfil a vital role in the modern care of the elderly, provided that they are offered the right patient for their facilities.—I am, etc.,

Brighton. S. M. VINE.

Coloured Driving-glasses

SIR,—Dr. E. A. Aslett (*Journal*, July 3, p. 49), in referring to your annotation on this subject (June 5, p. 1313), suggests the use of half "lenses" to partially obscure the right visual field. This, however, is also a dangerous practice at night, as off-side vision would be seriously impaired by the lenses when there are no approaching lights. Further, the lenses of such sun-glasses provide very little protection from the effects of bright lights. In studying this interesting problem it is noteworthy that dazzle is a retinal effect, so that for those who use both eyes it is necessary to protect only one eye. On this basis the writer hangs to the sun visor of his car, with adhesive tape, a strip of very dark green celluloid-like material, measuring 2 in. (5 cm.) vertically by ¾ in. (2 cm.) across. This is so placed that with a slight upward movement of the head the approaching lights appear green, thus indicating that one eye (the right) is protected, and yet it can still look past the edge of the shade to the on-side of the road. The shade must be much more dense than any sun-glass lens, and indeed should be nearer to what is required to look at an eclipse of the sun. A fairly dense strip of developed photographic film will be found suitable.—I am, etc.,

Oxford. W. RITCHIE RUSSELL.

Renal Clearance of Creatinine and Urea

SIR,—Dr. Arthur Jordan (*Journal*, May 29, p. 1266) raises some points in connexion with my paper (*Journal*, May 15, p. 1130) on the renal clearance of creatinine and urea in the West African. May I say at once that I did not argue that the mechanism of urea excretion in the African differed from that of the European; my words, in fact, were that "the possibility . . . is the subject for further investigation." Dr. Jordan's remark that "such a conclusion is not

justified by the evidence" is thus based upon his misreading of the paper.

Dr. Jordan then proceeds to discuss the evidence pointing to the absence of a true "augmentation limit," but the later authors he quoted were not, after all, so very late, and he omitted the definitive paper of Van Slyke[1] as well as the critical review by Homer Smith.[2] I am in complete agreement with all these workers, and my adoption of the clinical convention of expression of the results as being obtained above or below the "augmentation limit" was designed to keep the communication as brief as possible. The results will shortly be published in more detail elsewhere. The work of the past 15 years has left no doubt that the phenomenon of augmentation is in fact a continual one, but since none of the elaborate equations proposed to describe the excretion[1] are adequate one is forced to employ these approximations.

The near certainty that urea is actively secreted by the renal tubular cells[3,4] and the strong possibility that this secretion is conditioned by the haemodynamic state of the kidney[5,6] makes the analysis of results even more difficult. A study of recent literature on this subject—for example, Raaschou[7]—will, I think, show that my analysis was not out of keeping with current practice.

The few Europeans studied in my series gave results in agreement with all previous work on these parameters in the European studied in Europe. The African data may therefore be compared with the whole mass of European data rather than the small "internal standard" of the local Europeans.

I am most grateful to Dr. Jordan for drawing my attention to the work on Indian subjects and upon British prisoners of the Japanese.—I am, etc.,

Lagos, Nigeria. R. A. KENNEY.

REFERENCES

1 *J. clin. Invest.*, 1947, **26**, 1159.
2 *The Kidney*, 1951. Oxford University Press, New York.
3 Barclay, J. A., *et al.* (1947). *Communication to the Seventeenth International Physiological Congress.*
4 —— (1947). *Acta med. scand.*, **128**, 500.
5 Kenney, R. A. (1949). *Nature, Lond.*, **163**, 952.
6 —— (1949). *J. Physiol.*, **110**, 25, P.
7 *Studies of Chronic Pyelonephritis*, 1948. Einar Munksgaard, Copenhagen.

Multiple Mongolism

SIR,—Drs. J. V. Morris and C. MacGillivray (*Journal*, March 20, p. 687) stated that they found three mongoloid children in a family of ten. They also stated that they had failed to find a similar instance in the British literature.

In an article, "Heredity and Mental Disorder," in the *Medical Journal of Australia*[1] I have referred to the case of three mongoloids in one generation.—I am, etc.,

Warwick S. J. CANTOR.

REFERENCE

1 *Med. J. Aust.*, 1953, **2**, 138.

An Unusual Case of Retention in Women

SIR,—I described as "senile haematocolpos"[1] a case very similar in causation, symptoms, and appearance, if not in treatment, to that reported by Dr. E. T. R. Holt (*Journal*, June 19, p. 1439). Before that, Diddle and Keettel had published such a case.[2] Later I reported, with T. K. Owen, a case of "Oestrogen-induced Haematometra and Haematosalpinx."[3]

The accumulation of blood above an obstruction in the female genital canal, arising from an endometrium stimulated by the administration of oestrogens, appears to be a fairly new but quite established pathological entity now. The designation "haematogynaulos," derived from the Greek words for blood, female and tube, has been suggested as a collective term comprising haematosalpinx, haematometra, haematotrachelos, and haematocolpos.[4]—I am, etc.,

Bournemouth. N. ALDERS.

REFERENCES

1 *Lancet*, 1949, **2**, 513.
2 *Amer. J. Obstet. Gynec.*, 1940, **39**, 791.
3 *J. Obstet. Gynaec. Brit. Emp.*, 1952, **59**, 214.
4 Alders, N. (1953). *J. Int. Coll. Surg.*, **19**, 286.

Ephedrine and Urine Flow

SIR,—Mr. A. Dickson Wright's valuable contribution (*Journal*, June 26, p. 1497) prompts me to add yet another occasion when ephedrine proved most useful.

In 1928 I was called to a man writhing in agony from a stone in his left kidney. I gave him two big doses of morphine without affording him any relief; it then occurred to me that morphine acted on the striped muscles of the body and that the stone would be gripped, whereas ephedrine, acting on the unstriped muscles, would allow the stone to pass. Half a grain (32 mg.) by mouth eased the pain at once, and when the pain returned after four hours relief was again given and the stone passed, without operation, next day. Dr. J. W. Linnell, of the Metropolitan Hospital, advised me to report this case, which I did in 1929.[1]

Ephedrine is also very useful in some cases of urticaria.—I am, etc.,

Beckenham, Kent. ARTHUR J. AMBROSE.

REFERENCE

1 *British Medical Journal*, 1929, **2**, 985.

Transmission of Poliomyelitis

SIR,—May I support your statement (*Journal*, March 13, p. 635) that poliomyelitis is a disease "of which the dissemination is so mysterious that we cannot know whether or when any given individual has been exposed to infection"?

A mild epidemic occurred in the State of Western Australia during February and March this year. During the period March 20, 1954, to April 1, 1954, the largest crowds in West Australian history congregated in the capital, Perth. The notifications of poliomyelitis for the relevant period suggest that the transmission of the disease depends on some other factor than simple contact with an infected person, and that crowding, *per se*, does not add to the risks of developing the disease.

The notifications for the relevant period are as follows: week ending March 20, 64; week ending March 27, 47; week ending April 3, 29; week ending April 10, 16; week ending April 17, 14. There was in fact a sharp drop in the period when any protagonist of the theory that crowds increase the spreading of poliomyelitis would expect a rise.—I am, etc.,

Wongan Hills, W.A. T. LOVEGROVE.

Restriction on Aureomycin

SIR,—I am delighted to see that Dr. J. Pinching (*Journal*, June 19, p. 1439) objects, as strongly as I do, to the embargo placed on general practitioners obtaining aureomycin except by application to recognized centres and for a specified list of diseases.

The reply I obtained from the Ministry of Health and the makers was to the effect that impure aureomycin had to be imported from the U.S.A. and therefore cost dollars, and that it is then purified in this country.

It would seem pertinent to ask why British manufacturing chemists are not yet making it.—I am, etc.,

Winchester. H. J. BLISS.

Desensitization to Antibiotics

SIR,—With reference to your annotation on desensitization to antibiotics (*Journal*, June 26, p. 1482) and the article by Professor John Crofton on "Desensitization to Streptomycin and P.A.S." (*Journal*, November 7, 1953, p. 1014), it may be of interest to record another case.

A staff nurse in the Meath Hospital, aged 32, developed the characteristic swelling and reddening of the eyelids together with a rash on the wrist, which was found to be due to streptomycin sensitivity, so that she was unable to give injections.

Desensitization was started on November 18, 1953, when 50 μg. of streptomycin sulphate was given. No larger dose was tolerated until December 3, when 75 μg. produced a slight reaction. The dose was slowly increased until by January 2

it had reached 400 μg., which produced quite a marked reaction—the same dose repeated five days later produced no reaction and only the slightest reaction followed further injections up to a maximum of 10 mg. At this stage she was allowed to start giving injections again, but immediately got a severe reaction, when it was realized that in her department it was the practice to give equal parts of dihydrostreptomycin and sulphate.

Desensitization was resumed with 250 μg. of dihydro and 25 mg. of sulphate, which produced a slight reaction; a further dose of 250 μg. dihydro produced quite a severe reaction. The dose was reduced to 125 μg. and was increased weekly, 200 μg., 250 μg., 500 μg., 1 mg., and 2.5 mg., each time with streptomycin sulphate in addition. Desensitizing was completed by May 6, and she is now able to give streptomycin injections without trouble.

It is perhaps worth noting that it is essential to desensitize with both forms of streptomycin simultaneously, and that it may require great patience to achieve a satisfactory result.—I am, etc.,

Dublin. BRENDAN O'BRIEN.

The Role of Smoking in Bronchitis

SIR,—Dr. K. N. V. Palmer, in his article, "The Role of Smoking in Bronchitis" (*Journal*, June 26, p. 1473), makes no mention of the occupation of the men examined, and it is surely quite wrong to say, as he does, that "the main factors other than smoking which are likely to predispose to a history of bronchitis are satisfactorily distributed between the groups," when he has not considered the occupational factor at all.

Some time ago I undertook an investigation into the health of a small group of gas board employees, with particular regard to the incidence of bronchitis, and, though the number of cases found makes my results (yet to be published) too small for accurate statistical assessment on this point, they do tend to show that there is no higher incidence of bronchitis among the smokers than the non-smokers. However, they do show a higher incidence in those men who have worked for some time in dusty jobs than in those who have always been in non-dusty work, and this is also shown in an investigation by C. J. Cummins *et al.*[1] amongst gas employees in New South Wales.

Strangely enough, I found that there were more heavy smokers amongst those men on the dusty jobs than amongst those employed otherwise, and if by any chance this should also apply in Dr. Palmer's group it may well be that the occupation has some bearing on the results obtained, and prove a greater factor in the incidence of bronchitis than the amount of tobacco smoked.

Dr. Palmer's results would appear to be of little value without an assessment of the occupational factor.—I am, etc.,

Sheffield. JAMES GREGORY.

REFERENCE

[1] *An Investigation into the Health of 625 Employees Engaged in Gas Production in New South Wales*, 1952. Issued by the Division of Industrial Hygiene of the Department of Public Health, New South Wales.

Nitrate Cyanosis

SIR,—The following case is the first of its kind occurring in my district which has come to my notice.

On April 23 a full-time baby girl weighing 3 lb. 10 oz. (1.6 kg.) was born to a mother who had had diarrhoea for three weeks before the birth. It was very dehydrated and was fed entirely on the breast for three weeks. At the end of this period the breast feeds were complemented with 1–2 oz. (28–57 ml.) of National Dried Milk, made up with water from the well. At the age of 1 month the baby was having alternate feeds on the bottle, 3–3½ oz. (85–99 ml.) constituting each feed. Weaning was complete at the end of another week, when 3–4 oz. (85–114 ml.) feeds were being taken six times daily.

During the last week of the first month the colour of the baby began to deteriorate. The baby took longer over her feeds and began to get quite breathless (not distressed like a heart case); her colour got worse until on June 1 she became quite purple. The baby was active, cried, and was hungry. She was examined by a consultant, who pronounced the heart to be normal. At this stage the well water was suspected to be the cause, and it was submitted to chemical analysis. It was found to have a high degree of hardness, but in addition an excessive quantity of nitrates (50 parts nitrate nitrogen per million). Water containing nitrates in excess of 20 parts per million is unsuitable for giving to babies. Main water was therefore immediately procured, the first to be made up being the 6 o'clock feed. By next morning the colour was already improving; nevertheless the baby was admitted to hospital, where it was kept for a day, in which time it made a complete recovery.—I am, etc.,

Colchester. W. H. ALDERTON.

An Unusual Complication of Scabies

SIR,—Recently a patient presented himself with an irritating rash; he seemed mildly confused and his jaw was in splints. A letter of introduction from his doctor requested me to refer the patient to a psychiatric department if I felt this necessary. The history, so far as I could learn, was that this young man had suffered irritation for many weeks. He had been to one hospital where the rash was considered to be due to his nerves, and so he was given phenobarbitone tablets to take. On his second visit he reported no improvement and the dose of phenobarbitone was doubled for a further period. He then sought other advice and antihistamine pills were prescribed, and as a result he became so confused and ataxic that he fell down an escalator, breaking his jaw. His rash turned out to be a fairly typical scabies which responded promptly to routine treatment.

This case history illustrates the danger of not seeing the somatic wood for the psychic trees—a mistake which probably would not have been made 20 years ago.—I am, etc.,

London, W.1. STEPHEN GOLD.

Climate and Infantile Eczema

SIR,—In reply to a question on the advisability of taking a baby aged 6 months, suffering from infantile eczema, to West Africa, your expert states that the drier uplands might be satisfactory (*Journal*, July 3, p. 60). It must be remembered, however, that the uplands of West Africa are at times very hot and that during the rains the humidity is high. At Kano, Northern Nigeria, for example, during the months April–June day temperatures are over 100° F. (38° C.), and the humidity is rising. At this time of the year prickly heat is universal among European babies and is often of a severe degree. A baby with infantile eczema could be expected to suffer severely under these conditions. A further point is that infection of an unhealthy skin is very liable to occur in the dry months owing to the dust and flies. Furthermore, children who are at all delicate are liable to react badly to minor ailments such as enteritis and upper respiratory infections under tropical conditions. However careful parents may be, a child is almost sure to contract these during the course of a tour.

In my opinion the parents of the child should be advised not to take the baby to West Africa before the age of 2 years, when it can be seen what form the eczema is going to take. At this age also, as the child will spend much less time in a cot, it will be easier to keep him, or her, cool with suitable clothing, the use of fans, etc., although the mainstay of many parents, frequent cool baths for the toddler, may be inadvisable if the eczema has persisted.—I am, etc.,

Esher, Surrey. E. A. BEET.

Pilonidal Sinus

SIR,—The term pilonidal sinus means a hole in the body with hair arising in it. Some of these holes are congenital "failure of fusion," being found particularly on the bridge of the nose and over the sacrum. May I suggest that if the term "dermoid sinus" were used for these it would both

connect them with the similar condition of dermoid cysts and distinguish them from the quite different condition that may arise from sepsis in the perineum or axilla ?—I am, etc.,

London, W.1. DENIS BROWNE.

Interrupted Illumination for Microscopy

SIR,—I was interested to read, in your annotation concerning the Royal Society Conversazione (*Journal*, May 29, p. 1252) that Sir Geoffrey Taylor, F.R.S., and Lord Rothschild, F.R.S., had demonstrated bulls' spermatozoa under the microscope with interrupted illumination.

During the past three years I have found that interrupted microscope illumination, by its stroboscopic effect, has other applications. Certain small protozoa have contractile vacuoles which form and disappear quite rapidly. In one particular case—which at the time I identified as *Urocentrum turbo*—the vacuole is most picturesque, its star-shaped phase occurring at the rate of about five or six times a minute. The observation of this, however, is quite difficult, because the whole organism rotates in its long axis at a much higher speed. It was this which led me to devise a mechanism for interrupting the light, so that the organism might be caused to appear to stand still, while the vacuole was observed.

This was fairly successful, but since that first occasion, when I happened to have some of these organisms to look at, I have used the machine for observing the action of cilia. Not only the compound cilia of *Rotifera*, but the smaller ones of *Paramecium* and *Vorticella* may be made to appear to stand still. More than this, they may be allowed to appear to move in slow motion, either forwards or backwards. The delicate action of a cilium, as it appears under this stroboscopic illumination, is a beautiful thing to watch. The stroboscope permits the speed of the action of the cilia to be compared with that of other organisms in the same field. It is seen that, in a group of organisms—for example, *Paramecium*—the smaller specimens appear to move their cilia more rapidly than do the larger ones. This would fit in with our ideas of the metabolic rates of these small organisms, which are limited by the ratio of surface area to volume. The speeds of the cilia, however, do not remain constant over a long period of time; they alter from one moment to the next, apparently dependent upon what the animal is doing, whether it is moving in a straight line, or resting, or nosing its way into a heap of debris. However, there is, I think, a significant overall difference in the speeds of cilia of different-sized organisms, which is easily seen when the animals are crowded together. It is tempting to think of the speeds of cilia as rough indicators of the metabolic rates.

The device which I have used for this purpose is mechanical, and not the industrial type, which employs an electronic flash. A governor-controlled electric motor, of the gramophone type, with two plane mirrors attached, parallel to one another, to its shaft, is the basic mechanism. The beam from a conventional microscope lamp is reflected from these mirrors on to the substage mirror, and it is possible to obtain fairly critical illumination. The speed of the motor is conveniently varied by a lever, which operates a brake on the governor. Vibration is avoided by the use of rubber shock mountings.—I am, etc.,

Barnard Castle, Co. Durham. K. H. PICKWORTH.

Radiotherapy in its Relation to Dermatology

SIR,—May I commence by complimenting Professor B. W. Windeyer and by saying how pleased I was to read the publication of his timely and instructive lecture (*Journal*, April 24, p. 945) on the relationship that should exist between the pure radiotherapist and the dermatologist in the treatment of dermatological conditions? He states, so rightly, that "in dermatological radiotherapy, collaboration between the dermatologist and radiotherapist will bring the best results so far as the patient is concerned," and I would add that the surgeon can be profitably included in this collaboration. In many centres, as in Sydney, just such a happy collaboration exists between the above three branches of medicine. Professor Windeyer's lecture will, I hope, help to bring about the same state of affairs in some of the centres where the dermatologist tends to be pushed into the background and not allowed to treat many dermatological conditions, particularly cutaneous malignancies. In these latter instances the patient obviously cannot receive the best advice and treatment in every case if he is denied the benefit of the clinical knowledge and therapeutic acumen of the dermatologist, who, by the very nature of his specialty, must have a better all-round knowledge of cutaneous manifestations than either the radiotherapist or the surgeon.

It is a matter for regret that in some areas in Great Britain, admittedly owing to apathy or lack of interest on the part of the dermatologists in a few instances, radiotherapists have taken over the treatment of all cutaneous malignancies and sometimes that of other cutaneous conditions. This state of affairs is particularly noticeable in Queensland in Australia, where there is no apathy among the dermatologists. In this State the dermatologist's greater diagnostic and cutaneous radiotherapeutic ability is not given its rightfully earned place. And this obtains even when a dermatologist has gained a diploma in dermatological medicine, to obtain which a candidate must do a course and pass an examination of no mean standard in radiation physics, therapy, and electrotechnology. Apart from the above, I would like to mention several instances where my own experience does not coincide entirely with opinions expressed by Professor Windeyer.

(1) While agreeing that harder radiation than that with a quality of from 1.0 to 2.0 mm. of aluminium is better for the treatment of carcinomata involving bone, this is not necessarily the case where cartilage only is involved and suitable fractionation of dosage is employed.

(2) I no longer employ radiotherapy for solar hyperkeratoses, for the following reasons: (*a*) the cosmetic after-effect is much superior after carbon dioxide snow and acetone slush, (*b*) treated areas heal in from 7 to 10 days, as against some weeks when irradiation is employed, (*c*) the snow treatment can be used as often as required on any one area, (*d*) it is much quicker for multiple lesions.

(3) His statement that "there is no place in the attempted cure of cancer for the multiple-small-dose technique" does not hold for an occasional case such as that of a man who had had previous treatments for a number of basal cell carcinomata round the eyes and had lost one eye. He had developed a recurrent lesion on the lower lid of the good eye and surgery would have caused the loss of this eye. Also conventional radiotherapy would almost certainly have caused a necrosis on this already irradiated area. He was given *x*-ray therapy (H.V.L. 1.5 mm. aluminium) in doses of 100 r daily over approximately two months by Dr. Ward, of Newcastle (New South Wales), with an excellent result.

(4) It is my experience that surgical excision of warts on the soles is frequently followed by recurrence of the warts in and around the scar. If these lesions are not treated by *x*-radiation, which I consider to be a safe treatment provided there is sufficient underlying tissue, they should be removed by cryotherapy, chemotherapy, or curettage and packing with podophyllin 50% in tincture of benzoin compound for 24 hours.—I am, etc.,

Sydney, Australia. J. C. BELISARIO.

Engineering and Industrial Hygiene

SIR,—Readers of Dr. M. E. M. Herford's letter (*Journal*, July 3, p. 45) should realize that in certain industries in this country common-law actions are very common. The trade unions seek every opportunity to press claims on behalf of their members, and their journals contain long lists of successfully fought actions with details of the damages awarded. Employers insure against this. Premiums depend upon claims. Some insurance companies have inspectors who visit policy-holders' works and advise on methods of prevention. They send out circulars warning employers of the consequences of recent decisions in the courts. In many respects

the system is similar to that of our own medical defence organizations.

Just as the trade unions try to educate their members in matters relating to health, safety, and welfare, and to assist the sick and injured, so the employers' organizations investigate health and safety in their particular industries.

Although I have never been to America, my chief objection to the American compensation system—as portrayed in the literature—is that the industrial medical officer is too compensation-minded. Preliminary medical examinations are ruthless. We read that applicants for some jobs have several radiographs of the spine done to exclude persons with a predisposition to low back strain. Other parts of the body are examined with equal thoroughness. Let us hope this state of affairs never reaches England.

Dermatitis is a bad example. Diagnosis may be a problem, the precise cause cannot always be named, and susceptible men cannot always be detected in advance. If we agree that a combination of dust and sweat is a common cause, we must admit that prevention is difficult without a complete revolution in manufacturing methods.—I am, etc.,

Stanton, Gate, near Nottingham. R. N. WILSON.

Diagnostic Difficulties in Conservative Treatment of Perforated Ulcers

SIR,—Mr. Warren in his letter (*Journal*, June 19, p. 1440) seems to have missed the main purpose of my paper (*Journal*, February 13, p. 374) in an effort to defend the conservative method of treatment. I think it is fair to state that both methods, properly carried out, are equally effective. Mr. Warren seems to think I have never tried the conservative method. My own policy has been stated in my final paragraph—to accept the small risk of a diagnostic error in cases where laparotomy would be a serious ordeal. I have seen not a few gratifying recoveries in these very ill patients treated conservatively.

The second point raised was the question of how many laparotomies during my series were inadvertently carried out when the true condition was extra-abdominal. That of course is a diagnostic difficulty of the operative method, whereas my paper dealt with the diagnostic difficulty of the conservative method. The answer happens to be none, although I am fully aware of the possibility. It has been my experience that the diagnostic difficulty is much greater between perforation and other intra-abdominal conditions than between perforation and extra-abdominal conditions. Mr. Warren does not say if his experience differs. Mr. Warren says that in five of his cases diagnosis was uncertain and laparotomy carried out. These being the diagnostically difficult cases, might not one have been a coronary thrombosis, since coronary thrombosis can appear as an atypical perforation? The final point of the first paragraph of his letter is merely stressing the intelligent application of the conservative method—careful observation of the progress of the case and operative intervention if necessary.

Mr. Warren's illustrative cases show two features: first, that the conservative method gives good results; secondly, he confirms my fears of the occasional diagnostic difficulty. The fact that his four cases, initially misdiagnosed, all finally did well, does not mean that subsequent cases so handled will be equally fortunate. Finally, may I stress that the point of my paper was to illustrate the diagnostic difficulties of the conservative method of treatment, not to condemn the results of what is a thoroughly sound and proved procedure?—I am, etc.,

Portsmouth, Hants. T. G. CROMBIE.

Osler Memorial Tablet

SIR,—Our attention has been drawn to the letter (*Journal*, April 24, p. 988) referring to the proposal to fix a plaque on the wall of 13, Norham Gardens, to commemorate Osler's occupancy of the house. This is a project on which the Osler Club of London has been working for several years, and great delay has been caused by a change in the ownership of the house. We have only recently heard from the University Registry that we have the cordial approval of the Hebdomadal Council to fix and unveil a suitable plaque.

The total cost will be in the neighbourhood of £40, which it is hoped that members of the Osler Club will contribute. There may be others who would like to join in doing honour to the memory of Sir William Osler, and their subscriptions would be welcome if sent to the Treasurer, The Osler Club, c/o 11, Wimpole Street, London, W.1.—We are, etc.,

ALFRED WHITE FRANKLIN, President.
V. B. GREEN-ARMYTAGE, President-elect.
L. CARLYLE LYON, Member of Council.

London, W.1.

Medical Poetry

SIR,—As I am about to compile an anthology of medical poems, may I please ask your readers if they could let me have any they possess for publication in this? The anthology will contain poetry of a technical nature on the subject of medicine. There are many such poems not generally known because of their limited appeal. Where necessary, I will return all copies.—I am, etc.,

8, College Grove, Four Lane Ends, Castleford, Yorks. F. KNELLER.

Gratitude from Yugoslavia

SIR,—I should be grateful if you could find space to print an account of the following little incident.

While on holiday in Yugoslavia a waiter in a Belgrade hotel presented us with a beautiful bouquet of flowers. He had heard that there were two members of the British medical profession in our party, and he wanted to express his gratitude through us to the profession as a whole and to an Army doctor in particular, who, he believed, had saved his life somewhere in Italy during the last war. He assured us that none of the wounded Yugoslavs would ever forget the kindness, care, and excellent treatment they received from the British doctors.

As his gesture was not made to us in any personal way, I should like to pass on to the medical profession this expression of appreciation and gratitude from Yugoslavia.—I am, etc.,

Bearsden, Dunbarton. C. H. S. BEGG.

POINTS FROM LETTERS

Hygiene and the Sphygmomanometer Cuff

Dr. K. DORRY LOUTFY (Alexandria, Egypt) writes: Although all physical examinations include the measurement of the blood pressure, yet in all the apparatus used we apply the sphygmomanometer cuff directly around the arm. The same cuff is used for all the patients in spite of the fact that the arm may be covered with sweat or the skin affected with oozing eczema, scabies, or other skin lesions: a process which is unhygienic, not quite clean, and may be objected to by some persons. I have for some time used a piece of soft cleansing tissue paper or light linen or gauze applied to the arm under the cuff and changed it with each patient. This does not affect the blood-pressure readings, is more hygienic, and gives satisfaction to the patients.

Treatment of Sprained Ankle

Dr. A. S. WOOLSTONE (Norwich) writes: There are many methods in use for applying elastic adhesive plaster in the treatment of sprained ankle. For many years I have been using a method which endeavours to approximate the injured ligaments by keeping the foot in eversion. This is done by forcing the foot into eversion with the knee in flexion. The adhesive bandage is applied to the big-toe side of the foot, passing underneath, and then up over the outer side, then passing across the front of the ankle-joint to the medial side to the posterior surface and finishing off in front. By pinching the adhesive surfaces of the bandage together as it covers the lateral ligaments of the ankle-joint the strength of the bandage is greater where it is most required. A 2½-in. (6-cm.) bandage is most appropriate, and several pieces can be applied in this way, thus increasing the strength of the bandage.

Obituary

J. L. FRAZERHURST, M.D.

A notable medical and military career ended at Hastings, New Zealand, on May 21 with the death of Dr. J. L. Frazerhurst at the age of 80. Born in Northern Ireland, Joseph Livingston Frazerhurst was educated at Coleraine and at Durham University, where he graduated in medicine and in arts in 1897. Two years later he proceeded to the M.D., while holding an appointment at the Royal Victoria Infirmary, Newcastle-upon-Tyne. Service with the Northumberland Hussars at the age of 17 instilled in him a love of military life and an interest in soldiers which he always retained, for his last public engagement was as guest speaker at Wairoa on Anzac Day at the dedication of memorial gates to Maori soldiers.

After a short period in private practice in England, the lure of the distant places called and he went to China in 1899 in the service of the Imperial Chinese Railways. He was stationed at Shanhaikwan until the Boxer Rising, when with other members of the staff he escaped to the coast and was taken off by a gunboat. He joined H.M.S. *Barileur* as surgeon, later volunteering to act as interpreter to a detachment of German marines in the international force marching to the relief of the legations in Pekin. Later a bout of malaria and pneumonia necessitated a long convalescence in Japan, after which he returned to England to enlist for service in the war in South Africa. After the war he spent a few weeks at home before taking a trip to New Zealand, which so impressed him that he settled at Te Puke in 1903, his decision being reinforced by the request of a deputation of settlers. He remained there for four years and was instrumental in forming an efficient mounted rifle corps. He loved the open air life, which was just as well, for at one time he was the only doctor between Waihi and Whakatane and thus spent a good deal of his time in the saddle. Feeling that his professional work was suffering, he returned for postgraduate work in gynaecology in Dublin.

In 1912 Dr. Frazerhurst was appointed medical superintendent of Whangarei Hospital, an institution with eight patients. With vision and enthusiasm, he built up a modern and efficient hospital which in due course had physiotherapy, bacteriological, dietetic, and *x*-ray departments at a time when such services were only being discussed in much larger centres. Its maternity annexe, established for the benefit of backblock mothers, so far removed from skilled medical attention, was probably his greatest achievement, and was the prototype of those now a part of most hospitals. From 1919 he was also associated with the New Zealand Health Department in experimental social security schemes for miners, saw-mill, and country workers. The information gained from these schemes was used in drawing up the present health service.

One of the first to volunteer for service in the first world war, he organized the No. 1 Stationary Hospital, which saw service in Egypt, Salonika, and later France. It was while on the way to Salonika in the *Marquette* that he spent eight hours in the water when the ship was torpedoed. In France, as well as being adjutant of the unit, he did the radiological work also, and when plates ran out he cleaned old ones and drew in the position of foreign bodies with a grease pencil. The constant exposure to the *x* rays burnt his face and left his eyes weakened. From 1925 to 1929 he was A.D.M.S., Central Command, New Zealand, and from 1929 to 1935 he was Director of Medical Services, both of the Army and the Air Force. Though he volunteered for service in 1939, he could not be accepted because of his age and rank, so he began again as medical officer to the Hauraki Regiment encamped at Tauranga. As president of the medical board he examined 10,000 recruits, as well as continuing with his private practice. In 1947 he moved to Hastings, where he was actively engaged in a consulting practice until a few days before his death. His interest in his work was maintained by wide reading and attendance at postgraduate courses, where he met friends and discussed medical trends. In 1952 he attended the Annual Meeting of the B.M.A. in Dublin. He was always ready to share his deep store of knowledge, and many of his house-surgeons remember him with gratitude. He never spared himself but gave of his best to every patient, and his sympathetic approach and scrupulous examination were always appreciated and made him indeed "a beloved physician." He is survived by his second wife and three sons.

ARTHUR HILLYARD HOLMES, M.D., F.R.C.P.

Dr. Hillyard Holmes, consulting physician to the Manchester Royal Infirmary, died suddenly on July 3. He was 65 years of age.

Arthur Hillyard Holmes was born in 1889. After living for a short period in Australia, he was educated at the Victoria University of Manchester and the Manchester Royal Infirmary, graduating M.B., Ch.B. in 1911. He won many prizes as a student, including the Turner Medical Prize for the highest marks in medicine in the 1911 qualifying examination, which he passed with honours. Three years later he went to Serbia with a unit of the British Red Cross Society, working for a time as physician at a stationary hospital. But he had to retreat with the Serbian Army into Albania and, unfortunately, during the arduous journey lost his notes on an epidemic of typhus fever. His work was recognized by the awards of the Order of the Royal Red Cross of Serbia and Order of St. Sava (4th class). On returning to England he joined the R.A.M.C. and served in India and Mesopotamia. After the war he held successively the post of resident medical officer at the Infirmary, honorary physician to Ancoats Hospital, and lecturer in applied anatomy and in medicine. He was appointed to the honorary staff of the Infirmary in 1921, holding office until his retirement in April of this year. He was essentially a general physician with a special interest in diseases of the chest and a penchant for writing detailed notes on his patients, a habit he drilled into generations of students and house-physicians. He had the knack of picking out likely young consultants and successfully and tenaciously furthering their cause. The same tenacity showed up surprisingly in debate when he thought a matter of principle was involved. Although his main interest lay in the Infirmary, he held in addition the post of visiting physician to Withington Hospital. In 1949 he was elected president of the Manchester Medical Society, an honour he greatly appreciated. His original work took place in his younger days, when he published papers on the auriculo-ventricular bundle in mammals and on the Purkinje fibres in the auricles of birds. For this he was awarded his M.D. He became a member of the Royal College of Physicians in 1921 and a Fellow in 1936.

Holmes in his last decade was a notably successful warden of Lister House, the hostel where medical students live during their three months' resident appointments on the medical and surgical wards of the Infirmary. His duties were not always easy, for some students resented compulsory residence, and others were inclined to be alcoholic and rowdy, but he had a flair for the job and handled lively moments with tact and skill. It is difficult to see how he can be adequately replaced.

During the blitz his home was wrecked. This disaster was a blessing in disguise. It changed his life in an astonishing way. It led to his becoming warden and he bought a house at Bakewell, in Derbyshire, and there indulged, at week-ends, in his boyhood delights of horse-riding and hunting. His horses and dogs became his great hobby, but never completely displaced his interest in chess and cricket. Nothing pleased him more than to show photographs of his horses and dogs to his friends and to those with whom he worked on the hospital wards. It was sad indeed that within a month of his retirement from hospital work he was stricken with coronary thrombosis. He seemed to make a good recovery, but it was not to be. The final attack caught him while he was on the beach at Silverdale. He leaves a widow and two daughters, to whom we extend our sympathy.

The death of Dr. WILLIAM CASSELS in April removed a much-beloved and well-known figure from among the medical practitioners of Birmingham. He was 84 years of age. William Cassels was born on May 28, 1869, and was educated at Glasgow University, where he graduated M.B., C.M. in 1892. He settled at Birmingham in 1901 and continued in private practice there until last year, when he finally retired. For many years he was a member of the part-time staff of the Birmingham and Midland Ear and Throat Hospital, resigning the appointment in 1950, the year in which he gave up his work under the National Health Service. During the second world war he was chairman of the Smethwick medical board. As deputy medical officer at Winson Green Prison for a long period—he resigned in 1937—Dr. Cassels had among his many duties the unpleasant responsibility of forcibly feeding those suffragettes who were on hunger strike while serving prison sentences. As a result, he became unpopular with their sympathizers and was subject to demonstrations outside his home, which was then at Handsworth, and windows of his house was smashed during the disturbances. For recreation, he enjoyed a game of golf and was a keen bowler. A former president of the Handsworth Bowling Club, he established a record by winning the club championship seven times. His genial personality and ready sympathy made him a most lovable character, qualities which were strengthened by his sense of humour and his endearing Scottish accent. In professional matters, and indeed in every respect, his integrity was complete and he was greatly liked by his colleagues. His memory will remain green in the thoughts of all who knew him. He leaves a son and a step-daughter.—E. E. R. S.

Dr. J. B. HIGGINS, consultant radiologist to the Lancaster and Kendal group of hospitals, died in Lancaster Royal Infirmary on May 11 at the age of 62. A son of Dr. T. Higgins, of Manchester, James Basil Higgins was born in that city on December 7, 1891, and was educated at Manchester University, where he graduated M.B., Ch.B. in 1919. In the following year he obtained the Cambridge D.M.R.E. Dr. Higgins was the first to hold the post of registrar in radiology at Manchester Royal Infirmary. His appointment as radiologist to Crumpsall Hospital soon followed, and later he became honorary consultant radiologist to Salford Royal Hospital and to the Manchester and Salford Hospital for Diseases of the Skin. He was also appointed honorary radiologist to Lancaster Royal Infirmary, and in 1939 he gave up his work at the Manchester hospitals to become a full-time radiologist at the Lancaster and Morecambe hospitals. On the introduction of the National Health Service in 1948 he became senior consultant radiologist to the group. At Manchester University he obtained a blue in boxing as a bantam-weight, and later he became a keen golfer. From his friendship with L. du Garde Peach probably arose his active interest in amateur dramatic societies. His colleagues and friends held him in high esteem and affection, and many of them attended the memorial service at Lancaster Priory Church. The sympathy of all who knew him is extended to his widow and to his two sons.—J. W.

Lieutenant-Colonel G. H. FROST, I.M.S. (ret.), died at his home at Tenbury, Worcestershire, on May 26 at the age of 87. George Hewitt Frost was born at Ennis, Co. Clare, on April 2, 1867, and was educated at Blackrock College and at the former Royal University of Ireland, graduating M.B., B.Ch. and winning a gold medal in 1890. After graduation he entered the Army School of Medicine, where he gained another gold medal and the Maclean prize in 1891, the year in which he was commissioned. In 1892 he served with the Miranzai Valley expedition on the North-West Frontier of India, and four years later was appointed medical officer to the 2/4 battalion of the Gurkha Rifles, remaining with them until 1918, when he became officer commanding the Indian Stationary Hospital at Mhow, in Central India. He served throughout both the wars in South Africa, from 1899 to 1902, and was awarded the Queen's medal, with five clasps. He preserved with pride the flag which flew over his hospital at Ladysmith during the siege. On active service again in the first world war, Colonel Frost was in command of No. 111 Indian Field Ambulance in 1914–15 and won the Mons Star and other war medals. He retired in 1921 after thirty years' service, settling at Tenbury, where he became a vice-president of the local branch of the British Legion, an honour of which he was particularly proud. He held a similar office in the cricket club and the amateur dramatic society. Shooting was a sport in which he took a very keen interest, and many trophies of the chase from the higher Himalayas decorated his home. His other recreations included fishing and, in his younger days, tennis. Although latterly much confined to the house, he continued to take a lively interest in the affairs of the medical profession, and to the end was a constant reader of the *British Medical Journal*. He leaves a widow.

Many of the older residents of Sutton, Surrey, will have heard with regret of the death of Dr. C. R. VERLING-BROWN, who died in hospital in London on June 3 at the age of 79. Charles Richard Verling-Brown was born on September 23, 1874, and received his medical training at St. Bartholomew's Hospital, qualifying M.R.C.S., L.R.C.P. in 1900. Four years later he obtained the London M.B., proceeding M.D. in 1906. After qualification he held resident appointments at Bart's and at Queen Charlotte's Lying-in Hospital. Subsequently he joined a partnership at Sutton, where he was in general practice for many years. In the first world war he served with his partners in the R.A.M.C. A few years after the war he retired from general practice to study ophthalmology, in which he had always been interested, and was appointed chief clinical assistant at Moorfields, having taken the D.O.M.S. in 1928. When he gave up general practice Dr. Verling-Brown moved to Bookham, practising there and at Weybridge as a specialist in ophthalmology and becoming ophthalmic surgeon to the Cobham and District Hospital. A prominent freemason, he became the grand superintendent of the Royal Arch Chapter of the province of Surrey and an officer of the Grand Lodge of England, and in the craft he had many staunch friends. Ethically, Dr. Verling-Brown was a strict disciplinarian. His word was his bond

and it was always the straight path that appealed to him. His friends will always remember him as a fine example of the true type of English gentleman and will always revere his memory. The deep sympathy of all who knew him is extended to his widow and to his other relatives in their irreparable loss.—D. G. H. and T. H. W.

Dr. EDMUND CLEATON ROBERTS, who died at the age of 78 on June 3, had formerly practised for many years at Bedford. He received his medical education at Liverpool University, graduating with the M.B., Ch.B. (Victoria) in 1901, and taking the M.B., Ch.B. of Liverpool in 1904. In the same year he was awarded the Thelwall Thomas Fellowship in surgical pathology at Liverpool University. After holding resident appointments at the Royal Infirmary, Liverpool, he went in 1908 to Bedford, where he set up in general practice. During the first world war he served in the R.A.M.C., holding the rank of captain. In 1919, having returned to his practice at Bedford, he was appointed assistant honorary physician of Bedford County Hospital, and later honorary physician. His work at the hospital continued until 1926, when, owing to ill-health, he reluctantly gave up his appointment. He carried on with his general practice until he found it necessary to retire in 1934, when he moved to Surrey. Dr. Cleaton Roberts always went out of his way to help his fellow practitioners, though unfortunately ill-health prevented him from carrying out all the work that he wished to do. For many years he was local secretary of the Royal Medical Benevolent Fund.

By the death of Dr. N. M. FERGUSSON on June 5, Eltham has lost one of its most senior and best-loved general practitioners. Norman Mello Fergusson was born at Sittingbourne in 1883, the eldest son of Dr. William Balfour Fergusson, and was brought up in the old tradition of medicine. He was educated at Worcester, Magdalene College, Cambridge, and at St. Thomas's Hospital, where he gained the surgery prize for 1906–7. After graduating M.B., B.Chir. in 1908 he held the appointments of casualty officer and house-surgeon at St. Thomas's and junior demonstrator in anatomy at Cambridge. He then settled in general practice at Eltham, where he worked until illness forced his retirement about a year ago. During the first world war he served for four years in the R.A.M.C., mainly in France. A member of the Territorial Army for many years, he had attained the rank of lieutenant-colonel by the time he retired from the Service in 1938. For his work in connexion with the Territorials he was appointed O.B.E. in 1936. A keen freemason, he had held high office in the craft. He was also a prominent member and at one time captain of the Royal Blackheath Golf Club. He will be remembered with gratitude by several generations of his former patients, for he never spared himself in his work. He was an excellent obstetrician, and much of his success as a general practitioner stemmed from this. His main interest, however, was surgical, and he was for many years a general surgeon at Eltham Cottage Hospital, whose interests he served devotedly both as a surgeon and as a keen supporter of the small voluntary hospital. His unflagging interest in his patients' welfare, and the scrupulous care with which he treated them, were part and parcel of his strong and vigorous personality. Those who knew him in a more intimate sense will miss him for these qualities, and for others as well—his firm and sensible handling of committees, his strong professional ideals, his justness, kindliness, and helpfulness as a partner and as a colleague, and perhaps most of all for his robust and vital sense of humour.—A. A. M.

Dr. RICHARD A. COOKE died at Aspull, near Wigan, on June 7. He was 59 years of age. Richard Alphonso Cooke was born at Aspull, and educated at St. Bedes College, Manchester, and Liverpool University, qualifying in medicine in 1919. He then went into practice with his father and brother—Dr. W. E. Cooke, F.R.C.P., who later became pathologist at the Royal Albert Edward Infirmary, Wigan. Richard Cooke practised at Aspull all his life, and was recently joined by his son, Dr. E. P. Cooke, and Dr. T. H. Simmonds. He was medical officer of health and police surgeon for the area. A member of the Wigan local medical committee, and of the panel committee prior to 1948, he was a very popular and competent chairman of the Wigan Division of the B.M.A. in 1949 and 1950. His neat appearance and quiet, courteous manner impressed everyone. A man of great integrity, he always upheld the highest standard of medical ethics. He will be sadly missed by his patients and professional companions alike, and our sympathy goes out to his family in their great loss.—G. A. T.-J.

Dr. RICHARD DAVIDSON, one of the oldest and most respected general practitioners in Halifax, died at Bradford on June 11, aged 75. He came of farming stock and was born at Jaburgh on February 15, 1879. From the Royal High School, Edinburgh, he went on to study medicine at Edinburgh University. He was a prosector in the anatomy department under the great Professor Cunningham and earned praise for his dissections for the *Edinburgh Stereoscopic Atlas of Anatomy*. After graduating in 1906 and holding the post of house-surgeon at Peterborough Infirmary, he joined Dr. Walker, of Hebden Bridge, as his assistant in general practice in 1909, and ultimately succeeded him in the practice. Before going into practice he went on a voyage to China, Japan, and Java as a ship surgeon. His work at Hebden Bridge was most varied, and there he developed his leaning to surgery, and, in fact, did many operations in those early days in the cottage homes among the hills of that West Riding community. He made for himself a great reputation as a general-practitioner surgeon. In the early 1920s he moved to Halifax and became medical superintendent of St. Luke's Hospital there and medical officer to the Gilbert Street Institution (now St. John's Hospital), where he did excellent work. Much of the credit for the real beginning of surgery at St. Luke's Hospital, now the Halifax General Hospital, must go to him. In spite of his age he worked up to a few weeks before his death, dispensing kindness, skill, and care to his patients. As a raconteur he was well known, and some of his escapades on horseback on the hills above Hebden Bridge in winter practice were both entertaining and enlightening. He leaves a widow, three sons (two of them doctors), and a daughter, and to them we offer our most sincere condolences.—T. L. C.

Dr. T. E. HOWELL died at Pembury Hospital, Kent, on June 25 at the age of 53. Tudor Edward Howell was born near Risca, Monmouthshire, on October 5, 1900. He served in the Royal Air Force during the first world war and on discharge he entered the coal mining industry, obtaining a first-class mine manager's certificate in 1924 and being admitted to membership of the Institute of Mining Engineers in the following year. After a few years in coal mining he decided to study medicine and entered the medical school at Guy's, qualifying in 1934. In 1937 he graduated M.B., B.S. After a short period in general practice Dr. Howell returned to Guy's as registrar and chief clinical assistant at the medical out-patient department. In 1938 he joined the Factory Department of the Home Office as Medical Inspector of Factories in charge of the South-western Region, and after five years, during which time he was lecturer in industrial hygiene at Bristol University, he left the Factory Department to join the Ministry of Fuel and Power as Deputy Chief Mines Medical Officer in the newly created Mines Medical Service. In this post his mining qualifications and practical experience were of particular value in tackling the many health problems associated with work in the mines. In 1950 Dr. Howell became Principal Medical Inspector of Mines, and it was a matter of much regret to his colleagues in the Ministry when illness compelled him to cease work in 1952, for his counsel and guidance were invaluable. It is sad to think that one of his capability should die at so early an age, and he will be mourned by a wide circle of friends who will miss not only a competent colleague but also a genial companion who delighted to initiate stimulating and sometimes provocative discussions on a variety of subjects.

Dr. GEORGE SOWDEN, barrister-at-law, who was medical officer of health to the Metropolitan Borough of St. Pancras from 1923 to 1934, died at Ryde, Isle of Wight, on July 1 at the age of 85. Dr. Sowden qualified in 1900, and in 1902 he obtained the D.P.H.Camb. A year later he proceeded to the degree of M.D., with honours. Before his official appointment as medical officer of health, he was for many years in private practice in the borough of St. Pancras, and it was his knowledge of housing, gained while so engaged, which made him an enthusiast for the work of slum clearance. In 1931–2 he was chairman of the St. Pancras Division of the B.M.A. Dr. Sowden had a charm peculiarly his own, and all those who came into contact with him were impressed with his quiet efficiency. Although he never lost his "bedside manner," he was an efficient and able administrator, a ruthless reorganizer, and one who so held the reins that he knew which member of his public health team required prodding, which member required encouragement, and which one merited praise. He excelled when giving evidence at public inquiries, especially in reference to clearance areas, where his legal training made him an excellent witness, unshakable under cross-examination. With the passage of 20 years since his retirement, only a few among the present St. Pancras Town Hall staff remember him, but it is a sign of the impression he left behind that many of his reports are still referred to, and are considered a model of clarity and brevity.—D. H. G.

Dr. J. P. PARKINSON, physician-superintendent of the Holywood Hall Sanatorium, Wolsingham, Co. Durham, died recently at the age of 39. John Percival Parkinson was born on July 22, 1914, and was educated at Newcastle-upon-Tyne, graduating M.B., B.S. from Durham University in 1937. After graduation he was appointed assistant tuberculosis officer by the Northumberland County Council. On the outbreak of war in 1939 he was mobilized as an officer in the Territorial Army: he attained the rank of lieutenant-colonel and was mentioned in dispatches in 1945 in recognition of gallant and distinguished services in the field. Two years later he was awarded the Efficiency Medal of the Territorial Army. In 1948 he was appointed physician-superintendent at Walton Hospital, Chesterfield, occupying the post until 1951, when he obtained a similar appointment at Holywood Hall Sanatorium. At Wolsingham he also became consultant physician to the Leazes House and Horn Hall sanatoria.

T. A. B. writes: His many friends at Chesterfield mourn the death at an early age of "Peter" Parkinson, as he was affectionately known to us. He was physician-superintendent at Walton Hospital from 1948 to 1951, when it was quite obvious that he possessed the gifts of a first-class medical administrator and clinician. Peter was a staunch friend to all and sundry. He was loved by his medical colleagues and equally by his lay friends and acquaintances from all stations in life. He believed that the only aim of a patient in his sanatorium should be to get well, and he unstintingly devoted all his energies during his working hours to that end. Peter also played as hard as he worked. As a colleague he was loyal and straightforward: he hated duplicity in any shape or form. His old friends and colleagues at Chesterfield extend their sincere sympathy to his widow and children.

Universities and Colleges

UNIVERSITY OF LONDON

The following have been reappointed members of the Senate for the period May, 1954, to May, 1958: by Convocation, representing medicine, Sir Alexander Fleming, F.R.S.; by the Faculty of Medicine, Dr. E. R. Boland and Dr. C. F. Harris; appointed by the Deans of the General Medical Schools, Dr. Katharine G. Lloyd-Williams (vice Sir Harold Boldero).

Sir Stewart Duke-Elder has been appointed delegate of the University at the seventeenth International Congress of Ophthalmology to be held at Montreal from September 9 to 11 and at New York from September 12 to17, 1954.

Professor Esther M. Killick has been appointed representative of the University on the governing body of Queen Elizabeth College, and Dr. C. E. Newman representative on the governing body of the West London Hospital Medical School.

It was announced in Convocation on May 11 that Dr. Charles A. H. Franklyn had been appointed Bedell of Convocation and Dr. N. A. Thorne Deputy Bedell for the period ending February 1, 1955.

The first award of the Hazel Clifford Postgraduate Studentship, which is awarded for one year in the first instance for postgraduate research in medicine or on a scientific topic concerned with the advancement of medical knowledge, has been made to Anne Hamilton Clarke, B.Sc.

The Mary Scharlieb Research Studentship for 1954–5 has been awarded to Dr. Katharine Marian Dormandy (formerly Baker).

The A. M. Bird Entrance Scholarship at the Royal Free Hospital School of Medicine has been awarded to Myra Wharf (St. Helena School, Chesterfield) as a result of the London Inter-Collegiate Scholarships Board's examinations held in February, 1954.

Medical Notes in Parliament

REGISTRATION OF OPTICIANS

LORD MILNER OF LEEDS sought from the Government in the House of Lords on July 7 a statement of their intentions about giving effect to the Report of the Inter-Departmental Committee on the Statutory Registration of Opticians, which was presented in April, 1952.

Lord AMULREE expressed his pleasure at a body of professional people desiring to form a register and have a council to control their activities, and at the suggestion that the proposed general council should consist in the main of persons from the profession itself and not from outside. There seemed to be some difficulty about the group of people who practised orthoptics, and it was uncertain from the report whether they should come under the General Optical Council or be left as at present to medical examinations. He hoped that the Minister would be able to discuss the matter and ensure that, on whatever side they came, they would come in a contented way.

Lord CROOK, who was chairman of the committee, said he began his task with the gloomy knowledge that doctors disagreed with opticians and opticians disagreed among themselves, but after two years and a half of hard work the members of the committee were able to sign a report which, though it did not represent to any one of them all he would have liked to achieve, enabled a unanimous document to be presented.

It was unthinkable that sight could be treated by people without any qualifications whatever. The standards of three of the organizations had been carefully controlled, but some doubt had been expressed whether in respect of two there had been the care about academic and training qualifications that they would all like to see. He had been glad to learn informally that some of the criticisms offered in the report had already produced improvements in some respects. Commenting on the absence so far of co-operation by members of the medical profession in the training of opticians, he said that for various reasons—many of them good—members of the medical profession who had taken any part in the academic education or training had devoted themselves to anatomical and physiological aspects, and had played little or no part in any other medical assistance in clinical studies. No ophthalmic optician student had ever had a chance of access to a hospital. Only if an optician had the opportunity of training by medical men would he become as effective to do his job as he would wish. Lord Crook said he realized that the hospitals were fully occupied, but the close co-operation achieved in the committee by the doctors and opticians, who had been rivals, augured well for the future, and he hoped it would continue.

He urged on the Government that the General Optical Council when set up should have the fullest possible disci-

plinary powers and opportunity of dealing with ethical standards for the guidance and if necessary the control of this profession. It could not be right that ophthalmic optics should be practised as a 10 or 15% part of the job by a working jeweller, watchmaker, or radio technician, and one of the early tasks of the council should be to review this and see that the profession was made completely professional. He condemped the sale of spectacles in chain stores.

Lord CHARNWOOD, who said he was an optician, commended the report as the highest common denominator of the general and professional views of those concerned. Speaking as an examiner for one of the qualifying bodies, he asked what was the use of "ploughing" someone if he got in through a back door? There were not many let in through the back door, but they should not be let in at all. He did not much mind the chain-store trade in spectacles. A man in middle life might give himself a headache but could not hurt his eyes by wearing the wrong spectacles—certainly reading spectacles—although in a child it might start a squint. He would prefer prohibitive action directed against sun spectacles, which when put on children were habit-forming and retarded development of the eye. He expressed a strong view that dispensing and prescribing should be divorced, and urged that there should be three registers; particularly the third—of those who prescribed and did not dispense.

Lord OGMORE, presenting the views of the Association of Dispensing Opticians, said they agreed that, subject to safeguards, the first dual-function register should be closed at some time in the future and that a General Optical Council analogous to the G.M.C. should have power to effect this closure. It was not suggested that old applicants should be excluded from the register, and they did not propose to have three registers as the report suggested.

Lord KENSWOOD, a blind peer, said that unless opticians could get far more training than it was possible to give them they should not be allowed to diagnose or even to act without a prescription by an ophthalmologist. That was a counsel of perfection and could not be implemented because there were not enough ophthalmologists to do the examinations. With regard to clinical experience, after three years as chairman of hospitals he said it was not only the student who mattered, it was the patient. The report envisaged the possibility of opticians being sent into eye hospitals and allowed to examine the patient. That might be a *pis aller*, but it was not an ideal. The ideal to be sought was a sufficient number of qualified ophthalmologists. It was criminal to allow hawkers and chain stores to sell glasses, and that should be stopped at once.

Viscount WOOLTON, Chancellor of the Duchy of Lancaster, gave a preliminary caution that Parliament had always been disinclined to interfere with those already earning their living in any trade or profession, except to the extent necessary in the public interest, and that therefore in any proposals brought forward there would be the minimum disturbance to those now engaged in optical work. But, he said, the Minister of Health had had considerable discussions with the interested bodies. These were still proceeding, and he was told they were arriving at a good understanding. The Government certainly had legislation in mind, but he could not say when.

Fluoridation Test Areas

The experimental addition of fluorine to water supplies in selected areas, which was recommended by the mission to America sponsored by the English and Scottish Health Departments and the Medical Research Council in the spring of 1952, is to be carried out in Anglesey, Darlington, Kilmarnock, and Watford. Norwich was also selected as a test area, but the council there has so far deferred a decision.

This was announced by Lord MANCROFT, a Lord in Waiting, replying to a question by LORD DOUGLAS OF BARLOCH in the House of Lords on July 6. The councils of Norwich and Kilmarnock, he said, were informed that the Government departments would be prepared to assist them with technical advice. The Ministers undertook to defray the expenses which the councils would necessarily incur in connexion with the studies. It was added that, while the Ministers were advised that such action on their part would be within their statutory powers, they would be prepared to indemnify the councils for the cost of any legal proceedings in which they might be involved should the action of the councils be challenged. Similar invitations had been extended to the councils of Anglesey, Darlington, and Watford.

Lord DOUGLAS asked if it was the Government's intention to conduct this compulsory experiment on human beings and treat them as if they were no better than guinea-pigs. Lord MANCROFT refused to accept either of the implications in what he called "this highly provocative question." There was nothing compulsory about this, he said. It was an invitation which these councils had accepted.

Lord DOUGLAS.—How will any individual be able to escape being treated in this fashion when this stuff is put into the public water supplies?

Lord MANCROFT.—If anybody feels as strongly about this as Lord Douglas—and he is in a minority—he can move to an area which has not accepted the Minister's invitation.

Lord HADEN-GUEST.—Is there any evidence at all that the dilution proposed has any injurious effect on the health of the individuals who consume the water?

Lord MANCROFT.—Not only is there no evidence that it has injurious effects, but the evidence is to the contrary.

Lord HADEN-GUEST.—Exactly.

Sexual Offences Inquiry

The inquiry into the laws relating to homosexual offences and prostitution is to be conducted under the chairmanship of Mr. J. F. Wolfenden, Vice-Chancellor of Reading University, with the following terms of reference:

To consider: (*a*) the law and practice relating to homosexual offences and the treatment of persons convicted of such offences by the courts; and (*b*) the law and practice relating to offences against the criminal law in connexion with prostitution and solicitation for immoral purposes; and to report what changes, if any, are in their opinion desirable.

The HOME SECRETARY, announcing this on July 8, added that he hoped to be able to give the names of the other members of the committee before Parliament adjourned for the summer recess.

Reading Maternity Home Fire

Mr. F. M. BENNETT (Reading, North, C.) questioned the Minister of Health on July 8 about the inquiry into the fire at Delwood Maternity Home, Reading. Mr. IAIN MACLEOD stated that he considered the action taken by the hospital authorities both in the provision of the accommodation and in the matter of medical and nursing supervision was reasonable, and that there was no negligence or breach of duty on their part. The steps taken for the rescue and subsequent treatment of the babies were in accord with the highest traditions of the hospital service. His department was preparing advice to hospital authorities on fire precautions generally.

Cancer Investigations

Mr. R. H. GOWER (Barry, Con.) asked the Minister of Health on July 8 what information had been gained by officers of the Ministry about investigations in other countries into the relationship between smoking and cancer of the lung; and what steps he was taking to make this information available in the United Kingdom. Mr. IAIN MACLEOD stated that officers of the Department and of the Medical Research Council had been in close touch with investigations into this question in other countries, all of which had been or would be published in the medical and scientific press and were freely available to persons concerned.

Part-time Specialists Fees

Mr. A. BLENKINSOP (Newcastle-upon-Tyne, East, Lab.) asked the Minister of Health on July 8 whether he would consider the abolition of the payment of fees to part-time

specialists for domiciliary consultations. Mr. IAIN MACLEOD replied, "No," adding that in any case these fees formed part of the arrangements agreed in 1949 and any change in them would be a matter in the first place for the Medical Whitley Council.

Pneumoconiosis Claims

The MINISTER OF PENSIONS AND NATIONAL INSURANCE was questioned on July 5 about pneumoconiosis claims and examinations in the Midlands under the Industrial Injuries Act.

He informed Mr. BERNARD TAYLOR (Mansfield, Lab.) that the medical panel dealt with 44 applications from the Nottinghamshire coalfield in 1951, 58 in 1952, and 72 in 1953, and the numbers certified in these years were respectively 21, 19, and 25.

Mr. S. SWINGLER (Newcastle-under-Lyme, Lab.) asked for the numbers from Staffordshire who had appeared before the board. Mr. OSBERT PEAKE stated that separate figures were not available, but gave the following details of cases dealt with by the medical panel at Stoke-on-Trent, which covered Shropshire, Warwickshire, Worcestershire, and Herefordshire, as well as Staffordshire.

	Preliminary *X*-ray Examinations	First Examinations (Clinical)		
		Total	Diagnosed	Not Diagnosed
1951	791	735	544	191
1952	913	771	575	196
1953	1,637	1,315	1,147	168

Mr. BERNARD TAYLOR also asked how many applications for certification as suffering from tuberculosis had been made since the disease was prescribed. Mr. PEAKE said that up to the end of June some 4,150 claims were received from persons who appeared prima facie to be covered by the regulations, and of these about 3,500 were successful.

Thiourea.—Ninety-two cases have been reported to the Ministry of Food of contamination of fruit by thiourea, Dr. CHARLES HILL, Parliamentary Secretary, stated on July 5.

Rejected for Service.—The Minister of Labour stated in a reply on July 8 that the number of men rejected for National Service on medical grounds had been: 1948, 27,750; 1949, 36,370; 1950, 47,314; 1951, 43,856; 1952, 42,829; and 1953, 42,112.

Vital Statistics

England and Wales in 1953

According to the quarterly returns for March the birth rate for 1953 was 15.5 per 1,000 of the population, being 0.2 above the rate for 1952 but 0.7 below the average for 1948–52. The effective reproduction rate was 1.03. The infant mortality rate reached the record low level of 26.8 per 1,000 related births, being 0.8 below the rate for 1952. In the large towns with a population of over 200,000 the infant mortality rate varied from 16.9 in Harrow U.D. to 37.0 in Bradford C.B. The neonatal mortality rate, also the lowest recorded, was 17.7 per 1,000 related births.

The death rate was 11.4 per 1,000 of the population and was 0.1 above the rate for 1952 but 0.2 below the average of 1948–52. The deaths from respiratory tuberculosis numbered 7,912; these were 1,423 fewer than in 1952 and 4,119 fewer than in 1951. 990 deaths were attributed to other forms of tuberculosis, and these were 260 and 785 below the totals of 1952 and 1951 respectively. The fall in tuberculosis mortality has been relatively greater among females than among males. The deaths in 1953 as a percentage of those in 1951 were, for respiratory tuberculosis, 68.9 for males and 59.7 for females, and for other forms of tuberculosis 56.1 for males and 55.3 for females. Deaths from violence numbered 19,861; these were 1,059 more than in 1952 and 105 more than in 1951. Deaths due to motor vehicles and other transport accidents were 5,334; these were 8 more than in 1952 but 265 less than in 1951. A rise occurred in the number of deaths from accidental poisoning; there were 932 deaths in 1953 compared with 843 and 820 in 1952 and 1951. The number of deaths due to accidental burns decreased, 703 being registered in 1953 against 831 in 1952 and 888 in 1951. There were 4,754 cases of suicide, an increase of 416 and 285 on the totals for 1952 and 1951. Deaths from acute poliomyelitis numbered 320 compared with 275 in 1952, 191 in 1951, and 734 in 1950. The 23 deaths from diphtheria were 9 and 10 fewer than in 1952 and 1951. 243 deaths were due to whooping-cough, and these were 59 more than in 1952 but 213 less than in 1951. Measles showed a similar trend, the 244 deaths being 103 more than in 1952 but 73 fewer than in 1951.

Quarterly Returns for Eire

The birth rate for the first quarter of 1954 was 20.8 per 1,000 of the population and was 0.5 below the rate for the preceding first quarter. The infant mortality rate was 49 per 1,000 registered births and was 5 above the rate for the March quarter of 1953 but 6 below the average of the five preceding first quarters. The highest infant mortality rates were 98 in Laoighis county, 88 in Limerick county and 80 in Limerick C.B. The death rate was 14.2 per 1,000 of the population and was 0.1 below the rate for the preceding March quarter. The deaths from respiratory tuberculosis numbered 242 and from other forms of tuberculosis 57; these were 52 and 17, respectively, below the numbers for the first quarter of 1953 and were 249 and 57 below the average of the five preceding March quarters. Deaths ascribed to infectious diseases included 75 from influenza, 51 from gastro-enteritis (under 2 years), 11 from whooping-cough, 10 from measles, 5 from acute poliomyelitis, and 4 from diphtheria.

Week Ending July 3

The notifications of infectious diseases in England and Wales during the week included: scarlet fever 741, whooping-cough 2,211, diphtheria 20, measles 3,085, acute pneumonia 293, acute poliomyelitis 54, dysentery 661, paratyphoid fever 3, and typhoid fever 4.

Infectious Diseases

The largest variations in the trends of infectious diseases in England and Wales during the week ending June 26 were rises of 142 for whooping-cough, from 1,970 to 2,112, and 119 for scarlet fever, from 651 to 770, and falls of 270 for measles, from 3,106 to 2,836, and 61 for dysentery, from 896 to 835.

The largest fluctuations in the incidence of whooping-cough were increases of 37 in Gloucestershire, from 61 to 98, 34 in Yorkshire West Riding, from 93 to 127, and 32 in Norfolk, from 35 to 67, and decreases of 35 in Yorkshire East Riding, from 52 to 17, and 31 in Warwickshire, from 114 to 83. The largest increases in the number of notifications of scarlet fever were 30 in Lancashire, from 95 to 125, and 28 in Essex, from 35 to 63. 18 cases of diphtheria were notified, being 2 fewer than in the preceding week. The chief features of the returns for diphtheria were a rise in London from 1 to 4 and in Yorkshire West Riding from 0 to 3. The largest declines in the incidence of measles were 91 in Yorkshire West Riding, from 259 to 168, 46 in Durham, from 286 to 240, 43 in Cheshire, from 261 to 218, and 39 in Norfolk, from 240 to 201, and the largest increases were 56 in Surrey, from 77 to 133, and 31 in Cumberland, from 97 to 128.

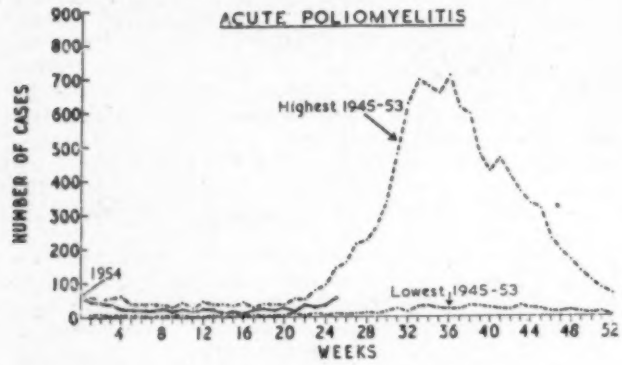
The seasonal rise of acute poliomyelitis has begun, and 53 cases were notified during the week. These were 17 more for paralytic and 4 more for non-paralytic cases than in the preceding week. The largest returns were Durham 8 (Sunderland C.B. 3, Easington R.D. 2), Cheshire 5 (Birkenhead C.B. 4), and Staffordshire 4 (Walsall C.B. 2).

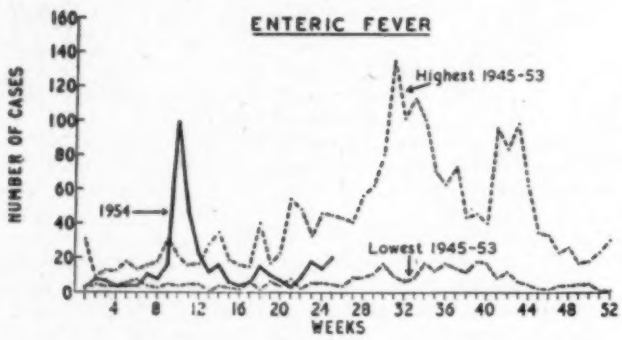
The chief centres of dysentery were Yorkshire West Riding 167 (Sheffield C.B. 68, Leeds C.B. 41, Dewsbury C.B. 16), London 130 (Fulham 52, Islington 18, Wandsworth 10), Lancashire 124 (Haydock U.D. 18, Liverpool C.B. 14,

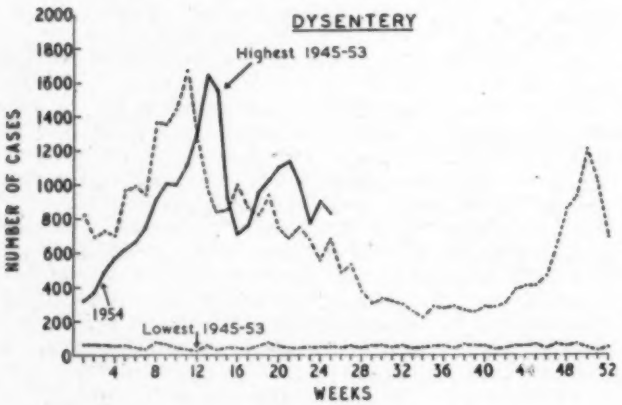
Manchester C.B. 14), Leicestershire 57 (Leicester C.B. 40), Oxfordshire 34 (Oxford C.B. 16, Bullingdon R.D. 13), Essex 27, Middlesex 26 (Willesden M.B. 13), Nottinghamshire 25 (Beeston and Stapleford U.D. 19), Sussex 24 (Brighton C.B. 12), Warwickshire 22 (Birmingham C.B. 16), Durham 21, and Surrey 20.

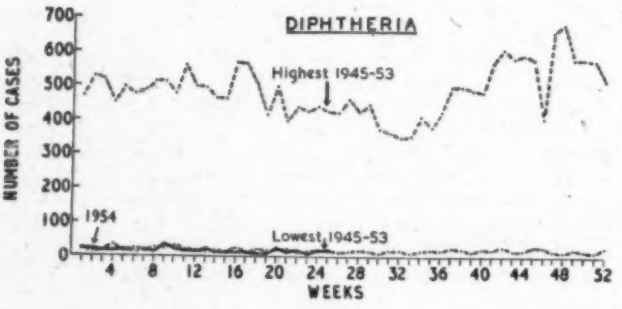
Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases of certain diseases notified weekly in England and Wales. Highest and lowest figures reported in each week during the nine years 1945–53 are shown thus - - - - - - -, the figures for 1954 thus ————. Except for the curves showing notifications in 1954, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.









INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending **June 26** (No. 25) and corresponding week 1953.

Figures of *cases* are for the countries shown and London administrative county. Figures of *deaths* and *births* are for the 160 great towns in England and Wales (London included), London administrative county, the 17 principal towns in Scotland, the 10 principal towns in Northern Ireland, and the 14 principal towns in Eire.

A blank space denotes disease not notifiable or no return available.

The table is based on information supplied by the Registrars-General of England and Wales, Scotland, N. Ireland, and Eire, the Ministry of Health and Local Government of N. Ireland, and the Department of Health of Eire.

CASES in Countries and London	1954					1953				
	Eng. & Wales	Lond.	Scot.	N. Ire.	Eire	Eng. & Wales	Lond.	Scot.	N. Ire.	Eire
Diphtheria	18	4	4	0	0	18	0	12	2	0
Dysentery	835	130	243	4	2	676	135	147	4	1
Encephalitis, acute	6	0	0	0		2	0	0	0	
Enteric fever:										
Typhoid	4	2	0	0	4	4	1	0	0	0
Paratyphoid	16	2	2	0	1	5	0	6 (B)	0	0
Food-poisoning	210	29		7		505			8	
Infective enteritis or diarrhoea under 2 years				15	15				22	18
Measles*	2,836	81	125	232	220	6,871	173	239	267	102
Meningococcal infection	28	3	14	2	1	43	4	17	0	2
Ophthalmia neonatorum	33	3	8	0		31	2	11	0	
Pneumonia†	286	13	132	77		328	16	143	5	
Poliomyelitis, acute:										
Paralytic	37	3	7	0	1	49	2	4	6	2
Non-paralytic	16	0				11	2			
Puerperal fever§	270	53	5	1	1	324	33	13	4	0
Scarlet fever	770	48	143	19	24	1,333	87	187	52	18
Tuberculosis:										
Respiratory	785	86	173	26				144	29	
Non-respiratory	155	10	22	6				36	6	
Whooping-cough	2,112	102	195	34	29	4,116	349	394	49	47

DEATHS in Great Towns	1954					1953				
	Eng. & Wales	Lond.	Scot.	N. Ire.	Eire	Eng. & Wales	Lond.	Scot.	N. Ire.	Eire
Diphtheria	1	0	0	0	0	0	0	0		0
Dysentery	0	0		0		3	0			
Encephalitis, acute		0			0		0			0
Enteric fever	0	0	0	0		0	0	0		
Infective enteritis or diarrhoea under 2 years	5	0	1	1	1	8	0	4	0	1
Influenza	4	0	2	0	0	6	0	1	0	2
Measles		0	0	0	0		0	0		1
Meningococcal infection		1	1				1	0		
Pneumonia	124	18	11	8	5	138	20	13	11	4
Poliomyelitis, acute	1	1			0	2	0			0
Scarlet fever		0	0	0	0		0	0		0
Tuberculosis:										
Respiratory	63	10	5	2	8	90	11	12	1	10
Non-respiratory		0	5	0	0		1	3	0	2
Whooping-cough	2	0	0	0	0	2	0	2	0	0
Deaths 0–1 year	192	19	29	4	20	233	28	37	9	12
Deaths (excluding stillbirths)	4,439	557	496	96	148	4,649	657	508		147
LIVE BIRTHS	7,860	1235	892	244	405	7,951	1232	879	235	368
STILLBIRTHS	218	19	26			211	19	28		

* Measles not notifiable in Scotland, whence returns are approximate.
† Includes primary and influenzal pneumonia.
§ Includes puerperal pyrexia.

Medical News

The Courage Laboratory of Ophthalmology.—H.R.H. THE DUCHESS OF GLOUCESTER opened the Courage Laboratory of Ophthalmology at the Royal Eye Hospital in London on July 6. In a welcoming speech, Mr. M. V. COURAGE thanked the tenants of his firm, who had been responsible for raising the money for the laboratory. The Courage Laboratory marks a new stage in the development of the Research Chair in Ophthalmology, which was set up eleven years ago by the Royal College of Surgeons and the Royal Eye Hospital. Sir CECIL WAKELEY bore testimony to the fine work that had been done under Professor Arnold Sorsby, the holder of the chair. The department had had the advantage of laboratory facilities at the Royal College of Surgeons, and when the rebuilding of the College was complete Professor Sorsby would have a department which was nearly commensurate with what he and his helpers deserved. Clinical facilities at the hospital had been difficult, owing to overcrowding, but that deficiency was now made good by the erection of the Courage Laboratory, which would be devoted exclusively to clinical investigations. THE MARQUESS OF NORMANBY, on behalf of the board of governors of King's College Hospital, then formally accepted the Laboratory from Mr. Courage.

Buckston Browne Dinner.—In 1927 Mr. (later Sir) BUCKSTON BROWNE gave £5,000 (in bank notes) to enable the Royal College of Surgeons to provide an annual dinner on the college premises, and during his lifetime regularly attended the dinners. At least half the guests were to be members of the college, for one of his aims was to promote the unity of the Fellows and members. At this year's dinner held on July 7 the Minister of Health, Mr. IAIN MACLEOD, said that since he became Minister of Health two years ago there was nowhere he had found more loyal and consistent support than from the Presidents of the Royal Colleges. Proposing the toast of the College, the Secretary of State for Air, Lord DE L'ISLE AND DUDLEY, V.C., dwelt on the great debt that the armed Forces owed to the surgeons, and the Royal Air Force especially to the plastic surgeons. Sir CECIL WAKELEY, P.R.C.S., replying to the toast, recalled the details of Buckston Browne's gift and reviewed the life of the College in the two years that had elapsed since the previous Buckston Browne Dinner. Repairs to the war-damaged museum and growth of the library had accompanied increased research throughout the College. The College had inaugurated a new scientific department, that of pharmacology. Here their benefactors were the pharmaceutical industry and, in particular, I.C.I. The Institute of Basic Medical Sciences, which the College conducted in association with London University, was in full swing, and the demand for its services exceeded what it could supply. He drew attention to the impressive buildings being erected —three new Wellcome museums with laboratories, a library extension, the exhibition hall and council room, and the hall where the diners sat. The conduct of the College's affairs was "a desperately expensive business" and one which had outrun its income. The council was seeking a remedy, and Sir Cecil appealed to all to do everything in their power to help it. Sir REGINALD WATSON-JONES then proposed the toast of the guests, and LORD WAVERLEY replied.

Memorial to Sir Patrick Manson.—A memorial plaque recording the birth of Sir Patrick Manson, his achievements, and the foundation of the London School of Tropical Medicine in 1899 was unveiled at Oldmeldrum, Aberdeenshire, by Sir ALAN MCLEAN of Littlewood, on July 7. The tablet, erected on a stone column on the wall of the garden of Cromlethill, the house where Sir Patrick was born, was provided by the London School of Hygiene and Tropical Medicine. The ceremony was followed by a luncheon at which the speakers were the Dean of the School, Dr. ANDREW TOPPING, Sir THOMAS TAYLOR, Principal of Aberdeen University, Sir GEORGE MCROBERT, Professor BRIAN MAEGRAITH, Sir PHILIP MANSON-BAHR, Sir ALAN MCLEAN, and Dr. LE ROUX, Provost of Oldmeldrum.

Portrait of Sir John McNee.—At the College Club, Glasgow University, on July 10 the new President of the B.M.A., Sir JOHN MCNEE, was presented with his portrait. The portrait, by Sir James Gunn, was subscribed for by medical colleagues and friends, mostly from Glasgow University. Sir ROBERT MUIR made the presentation.

A.M.A. President.—Dr. WALTER B. MARTIN, of Norfolk, Virginia, was inaugurated as president of the American Medical Association on June 22, at the 103rd annual meeting of the association in San Francisco.

Subject Heading Authority List.—The Armed Forces Medical Library, Washington, has published the subject heading authority list used in the preparation of the *Current List of Medical Literature*. The list comprises about 12,000 entries, about equally divided between subject headings and cross references, and includes an alphabetical and classified list of the standard subheadings used in conjunction with the main headings. It will be an essential accessory to the *Current List* and should prove a valuable guide to medical librarians and others needing an authoritative list of subject headings. The list is obtainable from the Superintendent of Documents, Government Printing Office, Washington, 25, D.C., price $1.75.

British Columbia Medical Library.—The Medical School of the University of British Columbia is trying to build up a library for the use of the staff and we are informed that to complete their sets of the *Quarterly Journal of Medicine* and of the *Proceedings of the Royal Society of Medicine* they want the following issues:—*Quarterly Journal of Medicine:* vol. 2, No. 7 (1909); v. 4, No. 15 (1911); v. 5, Nos. 18, 19 (1911–12); v. 8, Nos. 29, 30, 31 (1914–15); v. 11, No. 42 (1917); v. 14, No. 55 (1921). *Proceedings of the Royal Society of Medicine:* vol. 1, Nos. 1, 3–6, 10–12, title-page and index (1907–8); v. 2, Nos. 4, 7–12; v. 3; v. 4, Nos. 4–12, title-page and index; v. 5–14; v. 15, index only; v. 17, No. 10, title-page and index; v. 35, No. 1 (November, 1941). If anyone can help to fill the gaps in this new library they are asked to get in touch with Dr. Donald Paterson, Vancouver General Hospital, Health Centre for Children, 10th Avenue and Laurel Street, Vancouver 9, B.C., Canada.

Army Consultants' Dinner.—The annual dinner for consultants to the Royal Army Medical Corps was held in the Headquarters Mess, Royal Army Medical Corps, Millbank, on July 1 with Lieutenant-General Sir FREDERICK HARRIS, Director-General, Army Medical Services, in the chair. Major-General K. A. M. TOMORY, representing Colonels Commandant, and Major-General F. C. HILTON-SERGEANT, Commandant of the Royal Army Medical College, attended, together with 57 civilian honorary consultants and 16 consultants and advisers to the Regular Army. The Director-General proposed the toast to the guests, and Major-General Sir MAX PAGE replied.

R.S.M. Elections.—Besides electing Sir WILLIAM GILLIATT President, as reported in these columns last week, the Royal Society of Medicine at its annual meeting elected the following officers: honorary treasurers, Dr. S. COCHRANE SHANKS and Mr. E. G. MUIR; honorary secretaries, Mr. J. C. AINSWORTH-DAVIS and Dr. G. ORGANE; honorary librarians, Professor A. KEKWICK and Professor C. ROB; honorary editors, Sir HENEAGE OGILVIE and Dr. E. C. WARNER; honorary directors of photography, Professor K. FRANKLIN and Dr. D. A. MCDONALD. The immediate past-president is Sir Francis Walshe.

Two New Journals.—*The Journal of the Indian Medical Profession*, published monthly by A. MacRae and Co. Ltd., Bombay, aims to cater for both the specialist and the general practitioner. It is the latest of over 40 new medical journals which have made their appearance in India since that country attained its independence. The *Japanese Journal of Tuberculosis* is a quarterly publication from the Association of Research Institutes for Tuberculosis of National Universities in Japan. Since the war there has been a remarkable growth in the number of medical periodicals published in Japan, which now total about 200, of which some 30 are in English.

Chair of Physiology at Queen Elizabeth College, London.—Dr. J. A. C. KNOX, lecturer at King's College, London, has been appointed professor of physiology at Queen Elizabeth College, London.

Blood Transfusion Appointment—Dr. CHARLES CAMERON has been appointed regional director of the East of Scotland Blood Transfusion Service at Dundee from October 1, in succession to Dr. AVRIL JOHNSTONE, who has accepted a consultant post in England. Dr. Cameron is at present deputy director of the East Anglia Blood Transfusion Service at Cambridge.

B.M.A. Library.—The Library will be closed and the library service suspended from July 30 to August 16 while redecorating is being done.

Dr. Mary Esslemont was among those who received the honorary degree of LL.D. of Aberdeen University on July 9.

Sir Eric W. Fish has been reappointed chairman of the Dental Board of the United Kingdom.

Dr. J. B. Gibson has been appointed lecturer in pathology at Queen's University, Belfast.

Dr. H. Spencer, senior lecturer in pathology at St. Thomas's Hospital Medical School, has been appointed to the London University readership in morbid anatomy and histology tenable at that school.

Dr. D. R. Wilkie, Locke Research Fellow of the Royal Society, has been appointed to the University readership in experimental physiology tenable at University College, London.

COMING EVENTS

World Child Welfare Congress.—The International Union for Child Welfare, in co-operation with the National Council of Child Welfare Associations in Yugoslavia, will hold a world conference in Zagreb, Yugoslavia, from August 30 to September 4. Further information may be obtained from the secretariat, International Union for Child Welfare, 16, rue du Mont-Blanc, Geneva.

International Congress of Haematology.—The fifth congress will be held in the Sorbonne, Paris, from September 6 to 12. The official languages will be French and English. Further information may be obtained from the secretary, Expansion Scientifique, 15, rue Saint-Benoît, Paris, 6.

Fifth International Conference on Geographic Pathology.—The conference will be held from September 6 to 10 in Washington, D.C. The theme of the conference is the geographical pathology of cancer, with special reference to carcinoma of the stomach, liver, breast, uterus, and lung. Further information may be obtained from Professor ROBERT A. MOORE, M.D., Washington University, School of Medicine, 660, S. Kingshighway, St. Louis, 10 (Missouri), U.S.A.

International Congress of Associations of Doctor-Motorists.—The first post-war congress will be held in Vienna on September 8–11. The congress will be preceded by a rally through the principal Austrian spas and resorts. Details from the Sekretariat der Ärztlichen Kraftfahrvereinigung Österreichs, Weihburggasse 10–12, Vienna, 1, Austria.

Third International Congress of Internal Medicine.—This congress, organized by the International Society of Internal Medicine, will be held in Stockholm from September 15 to 18. Application forms and a preliminary programme may be obtained from the secretariat of the congress, Karolinska Sjukhuset, Stockholm 60, Sweden.

Royal Sanitary Institute.—The 1955 health congress will be held at Bournemouth in May, and will, for the first time, include a conference of domiciliary nurses and midwives. The Duke of Wellington, K.G., will be president of the Congress.

NEW ISSUES

Medical and Biological Illustration.—The new issue (Vol. 4, No. 2) will be available in a week's time. The contents include:

GAIT. C. Engel and Peter Hansell.
HENRY VANDYKE CARTER. W. J. Bishop.
SYMPOSIUM OF GRAPHIC METHODS.
EXPLOSION HAZARD IN ANAESTHESIA. A. W. Edridge.
INFRA-RED KINEMATOGRAPHY. J. Rieck.
X-RAY MICROSCOPY. V. E. Cosslett
WORKING MODEL OF AUTONOMIC DRUG ACTION. E. Grey Dimond, Kenneth Powell, and Ray Green.
EQUIPMENT AND METHODS:
CONCERTINA BOOKLETS.
DISPLAY STANDS.
LYNDALE PRINT PORTFOLIOS.
ILFORD JUNIOR FLASH GUN.
FLUORESCENT PHOTOGRAPHIC PAPERS.
PREMIER FILM WAXER.
ABSTRACTS.
BOOK REVIEWS.
MOTION PICTURES.
REPORTS FROM SOCIETIES.

Published quarterly; annual subscription £2 2s.; single copy 12s. 6d.; obtainable from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1.

British Journal of Industrial Medicine.—The new issue (Vol. 11, No. 3) will be available in a week's time. The contents include:

SOME TOXIC PROPERTIES OF DIMETHYLNITROSAMINE. J. M. Barnes and P. N. Magee.
A REPORT ON 235 CASES OF ERYSIPELOID IN ABERDEEN. D. M. Proctor and I. M. Richardson.
RAYNAUD'S PHENOMENON IN WORKERS WITH VIBRATORY TOOLS. R. P. Jepson.
THE TREATMENT OF COMPLICATED PNEUMOCONIOSIS WITH ISONIAZID. W. E. Miall, P. D. Oldham, and A. L. Cochrane.
SILICA AND COLLAGEN IN THE LUNGS OF SILICOTIC RATS TREATED WITH CORTISONE. B. D. Stacy and E. J. King.
THE DEVELOPMENT OF COMPENSATION FOR OCCUPATIONAL DISEASES OF THE LUNGS IN GREAT BRITAIN. Andrew Meiklejohn.
TUMOURS OF THE URINARY BLADDER IN WORKMEN ENGAGED IN THE MANUFACTURE OF CERTAIN DYESTUFF INTERMEDIATES IN THE BRITISH CHEMICAL INDUSTRY. Part II. R. A. M. Case and Joan T. Pearson.
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SOME PERSONAL OBSERVATIONS ON INDUSTRIAL HEALTH IN THE UNITED STATES OF AMERICA. Bryan Harvey.
SECOND CONFERENCE OF THE BRITISH OCCUPATIONAL HYGIENE SOCIETY. R. J. Sherwood.
OBITUARIES.
BOOK REVIEWS.
ABSTRACTS.

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SOCIETIES AND LECTURES

A fee is charged or a ticket is required for attending lectures marked ●. Application should be made first to the institution concerned.

Tuesday, July 20

●INSTITUTE OF NEUROLOGY.—5.30 p.m., Dr. J. H. Paterson: Diffuse Cerebro-vascular Arterial Disease.

LIVERPOOL MEDICAL INSTITUTION.—At David Lewis Northern Hospital, Liverpool, clinical demonstration: Diagnosis and Treatment of Peripheral Arterial and Venous Disease.

SOCIETY FOR THE STUDY OF ADDICTION TO ALCOHOL AND OTHER DRUGS.—At Medical Society of London, 11, Chandos Street, Cavendish Square, W., 8 p.m., Dr. Harry Feldmann (Geneva): Modern Treatment of Alcoholism, with Special Reference to Apomorphism: Biological, Psychological, and Social Aspects. Discussion.

Saturday, July 24

INSTITUTE OF ORTHOPAEDICS.—At 234, Great Portland Street, W., 10 a.m., clinical demonstration by Mr. K. I. Nissen.

MEDICAL SOCIETY FOR THE STUDY OF VENEREAL DISEASES.—2.30 p.m., 33rd annual general meeting.

APPOINTMENTS

EAST ANGLIAN REGIONAL HOSPITAL BOARD.—R. E. Glennie, M.D., D.C.H., D.P.M., Consultant Child Psychiatrist in the Cambridge Area; J. G. Taylor, M.B., B.S., F.R.C.S., Consultant Orthopaedic Surgeon to Norfolk and Norwich Hospital Group; F. Houston, M.R.C.S., L.R.C.P., D.P.M., Assistant Psychiatrist, Fulbourn and Addenbrooke's Hospitals; J. H. Cullen, M.B., B.Ch., Registrar in Psychiatry, Fulbourn and Addenbrooke's Hospitals; E. C. Scanlon, M.B., B.S., Surgical Registrar, West Suffolk General Hospital.

HOSPITAL FOR SICK CHILDREN, Great Ormond Street, London, W.C.—C. O. Carter, B.M., B.Ch., M.R.C.P., Part-time Medical Geneticist (S.H.M.O.). P. A. O'Meara, M.B., B.Ch., D.L.O., Registrar to the Ear, Nose and Throat Department. Wendy A. Clark, M.B., B.S., F.F.A. R.C.S., Junior Resident Anaesthetist. Lizbeth Sloman, M.D., House-physician to Professor A. A. Moncrieff.

LECUTIER, EDMUND RENE, M.B., Ch.B., F.R.C.S., Consultant Thoracic Surgeon, Bradford Royal Infirmary, and Middleton and Grassington Group of Hospitals.

MANCHESTER REGIONAL HOSPITAL BOARD.—T. M. Wilson, M.B., Ch.B., M.R.C.P.Ed., Consultant Chest Physician and Physician Superintendent, Baguley Hospital, Manchester. P. W. Harvey, M.B., Ch.B., Dip.Path., Consultant Pathologist, Group Laboratory, Victoria Hospital, Blackpool. T. E. Shannon, M.B., B.Ch., D.O.M.S., Consultant Ophthalmologist, Bolton and District Hospitals.

SOUTH-WESTERN REGIONAL HOSPITAL BOARD.—J. E. M. Dutton, M.B., B.S., F.R.C.S., Senior Registrar in the Department of Neurological Surgery, Frenchay Hospital, Bristol; G. V. Balmforth, M.B., B.S., D.Obst.R.C.O.G., Medical Registrar at Gloucestershire Royal Hospital, Gloucester; Pauline M. Cole, M.B., B.S., D.C.H., Paediatric Registrar at South Devon and East Cornwall Hospitals, Plymouth (Joint appointment with United Bristol Hospitals); Jean O. Gerrard, M.B., Ch.B., Anaesthetic Registrar to Bath Group of Hospitals; M. A. Azam, M.B., B.S., F.R.C.S., Surgical Registrar at South Devon and East Cornwall Hospital, Plymouth; C. H. A. Hoy, M.B., B.S., Surgical Registrar to Torquay and Newton Abbot Hospitals.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Inman.—On July 9, 1954, in Bristol, to Margaret, wife of Dr. George Inman, a son.

Lewis.—On July 6, 1954, at the Churchill Hospital, Oxford, to Evelyn, M.B., Ch.B., wife of Charles L. Lewis, M.B., Ch.B., F.F.R., a brother for Alexandra and Joanna.

McLaren.—On June 27, 1954, at G. Udayagiri, Orissa, India, to Olga (formerly Evans), wife of Dr. D. S. McLaren, a sister for Gavin—Jillian Mary.

DEATHS

Burrow.—On June 25, 1954, Vincent Burrow, M.D., of Beeswing, Tipton St. John, Devon, late of Marlborough, Wilts.

Cameron.—On June 29, 1954, in hospital, Norman Cameron, O.B.E., M.B., Ch.B., Colonel, R.A.M.C., retired.

Conroy.—On June 27, 1954, Patrick Brian Conroy, M.R.C.S., L.R.C.P., F.F.A. R.C.S., of Wrightington, Wigan, Lancs, aged 38.

Crawford.—On July 11, 1954, at Sutton Valence, Maidstone, Kent, Donald McMichael Crawford, O.B.E., T.D., M.B., Ch.B.

Croly.—On June 28, 1954, William Chapman Croly, D.S.O., L.R.C.P.&S.I. & L.M., Lieutenant-Colonel, R.A.M.C., retired, of Ardvarna, Spa, Tralee, Co. Kerry, Eire.

Denham.—On June 15, 1954, at his home, Brisbane, Australia, Harold Knight Denham, M.R.C.S., L.R.C.P., aged 64.

Dunlop.—On July 2, 1954, at his home, Hugh Alexander Dunlop, M.D., M.Sc., F.R.C.P., late of 48, Wimpole Street, London, W., aged 50.

Dunsmore.—On June 18, 1954, at "Wynella," 70, Hoylake Drive, Skegness, Lincolnshire, William Patrick Joseph Dunsmore, L.R.C.P.&S.I., aged 52.

Elliott.—On June 20, 1954, at 6, Crooms Hill, Greenwich, Abraham Hyman Elliott, M.B., Ch.B., aged 56.

Forbes.—On July 8, 1954, at his home, 106, Shaftesbury Avenue, London, W., John Forbes, M.B., C.M., aged 85.

Grene.—On June 20, 1954, at 58, Longhill Road, Ovingdean, Brighton, Sussex, John Herbert Cecil Grene, M.B., B.Ch.

Harvey.—On June 30, 1954, at his home, Elmhurst, Thornbury, Glos, Gerald Sylvester Harvey, O.B.E., M.B., B.Ch., Surgeon Captain, R.N., retired.

Holmes.—On July 3, 1954, Arthur Hillyard Holmes, M.D., F.R.C.P., of Greystones, Bakewell.

Howell.—On June 23, 1954, at Pembury Hospital, near Tunbridge Wells, Kent, Tudor Edward Howell, M.B., B.S., of Dairy Cottage, Dower House Crescent, Southborough, Kent.

Jeffrey.—On July 2, 1954, at Aberdeen, John Jeffrey, O.B.E., M.D., F.R.C.S.Ed.

Jenson.—On June 21, 1954, at The White House, West Side, Wimbledon, Walter Pinnington Jensen, M.R.C.S., L.R.C.P.

Lilley.—On July 10, 1954, at his home, Burngreave, Bognor Regis, Sussex, Frederic Lilley, L.R.C.P.&S.Ed., L.R.F.P.S., formerly of Selly Park, Birmingham, and Weston-super-Mare, Somerset, aged 90.

Martin.—On July 6, 1954, at 28, St. Edmund's Road, Ipswich, Suffolk, George James Masson Martin, L.R.C.P.&S.I. & L.M., D.P.H., aged 68.

Patley.—On June 21, 1954, at Green Hayes, Pyrford, Surrey, Hubert Patley, M.D.

Pitt-Payne.—On July 6, 1954, at his home, 118, London Road, Bromley, Kent, William Pitt-Payne, M.B., late of Brockley, London, S.E.

Skinner.—On May 13, 1954, at his home, Little Wick, Nottingham Road, Ilkeston, Derbyshire, Thomas Edward Skinner, M.R.C.S., L.R.C.P., aged 52.

Sowden.—On July 1, 1954, at 16, Queen's Road, Ryde, Isle of Wight, George Sowden, M.D., D.P.H., formerly of London, N.W., aged 85.

Stevens.—On July 2, 1954, at his home, The Chestnuts, Old Leake, Boston, Lincs, Bertram Crossfield Stevens, M.D., M.S., F.R.C.S.Ed., D.P.H., aged 79.

Taylor.—On June 11, 1954, at "Crookdale House," Stalmine, near Fleetwood, Lancs, Andrew Taylor, M.B., Ch.B., aged 80.

Van Langenberg.—On June 16, 1954, at Winchester, Hants, Frederick Richard Van Langenberg, M.B., C.M., of 71, Boscombe Overcliffe Drive, Boscombe, Hants, formerly of Houghton-le-Spring, Co. Durham.

Woodroofe.—On May 28, 1954, at St. Ives, Cornwall, Edwin Royston Woodroofe, M.B., Ch.B., formerly of Bradford, Yorks, aged 59.

Any Questions?

Correspondents should give their names and addresses (not for publication) and include all relevant details in their questions, which should be typed. We publish here a selection of those questions and answers which seem to be of general interest.

Significance of a Raised Sedimentation Rate

Q.—*What are the likely causes of a persistently raised erythrocyte sedimentation rate (50–90 mm. Westergren) in a middle-aged man? He has been investigated in hospital without success: B.P., 160/102; Hb, 80%; barium meal and enema normal; stools negative for occult blood; chest radiograph normal; urine clear; acid phosphatase, 1.2 units; and serum amylase normal. Is it possible for such a level to occur in the absence of serious disease?*

A.—An erythrocyte sedimentation rate between 50 and 80 mm./hour (Westergren) should be taken to indicate that tissue destruction is taking place in the body owing either to a neoplasm or to an inflammatory reaction associated with infection or with one of the "collagen" diseases. The presence of cold agglutinins should be excluded. Values for the sedimentation rate such as these are due primarily to an increase of fibrinogen content of the plasma, although the globulins may also be increased. If this rate persists without any other sign or symptom, it would be useful confirmation to estimate the plasma viscosity and plasma fibrinogen, which should both be increased.

In addition to the investigations listed in the question (which should, of course, be repeated from time to time) an intravenous pyelogram may possibly reveal displacements due to intra-peritoneal lesions or to renal neoplasm. *X*-ray pictures of the pelvis and long bones may reveal signs of secondary neoplasm or myelomatosis, although these may be widespread in the skeleton without radiographic signs: the plasma alkaline phosphatase is often raised and should therefore be estimated. A bone-marrow biopsy may reveal reticulosis or neoplasm. Bronchoscopy or cholecystography may suggest neoplasm, and it should be remembered that occasionally oesophageal neoplasms remain symptomless for long periods. Although acute disseminated lupus erythematosus is rare in men of middle age, the L.E. cell should be looked for in the serum, and a Rose test (differential agglutination of sheep cells) performed. A Wassermann reaction should be performed. Electrocardiography and the estimation of antistreptolysin titre are sometimes useful in suggesting symptomless rheumatic fever.

Ventilation of a Waiting-room

Q.—*What is the best way to ventilate a waiting-room? If the windows are opened then people are frozen, and if the windows are closed the room gets stuffy.*

A.—In cold weather the amount of ventilation that can be tolerated depends largely on the adequacy of the heating arrangements. If the heating appliance is only enough to maintain satisfactory warmth when the room is closed, the room will be chilly with a window open.

Given an adequate heater, it should be possible to admit enough fresh air in cold weather without excessive draughts if a little discretion is used. Opening a window to the extent of about 1 inch (2.5 cm.) will allow a useful interchange of air, and such an opening will probably be adequate if there is an open fire, but in a flueless room rather more opening may be needed. With casement and hopper windows, open at high level, and with sash windows, lower the upper sash slightly. A useful device with sash windows is the Hinckes-Bird's board. This is a piece of wood, say, 3 inches (8 cm.) wide cut to fit snugly in the window frame beneath the lower sash. Then air can enter between the sashes, and it tends to be directed upwards, thus reducing

draughts. This, with slight opening of the top sash, should generally give good ventilation—but enough heat must be supplied.

Climate and Catarrh

Q.—*What type of climate will most likely help to cure persistent recurrent catarrh of the nasopharynx? Can you name some places in England or Wales where such a climate may be found?*

A.—Though the term nasopharyngeal catarrh can include a variety of disorders with differing causes, it is most commonly employed to describe the dropping down of mucus from the nose into the throat.

It is a natural process for mucus to be carried by the ciliated epithelium lining the nose backwards into the throat, but if this becomes a conscious process it means that there is an excessive secretion of mucus by the nasal epithelium. The commonest cause of this is irritation, which may be from tobacco or possibly as the result of inhaling particles of dust to which the subject is allergic. It is in the latter type of case that geographical location may play a part, and it has been generally found that mountainous and seaside locations are the least likely to be contaminated by the common allergens.

Other causes of nasopharyngeal catarrh include sinus infection and atrophic rhinitis, and neither of these conditions is likely to be influenced by any change of climate experienced within the British Isles.

Haemorrhage into the Amniotic Sac

Q.—*What are the causes of haemorrhage into the amniotic sac? What symptoms does it cause, and what action is indicated?*

A.—Haemorrhage into the amniotic sac may be maternal or foetal in origin. It can occur during pregnancy or labour, but it cannot be diagnosed until the membranes rupture or are punctured and the blood-stained liquor is seen. If some of the blood can be collected for examination its source can be determined by examining stained smears. Foetal blood usually contains a significant number of nucleated red cells. More complicated tests, such as determining its group and comparing it with that of the mother, might also be possible. In any case, however, a good idea of the source of the haemorrhage is obtained by the clinical features. If the blood is foetal, the foetus is likely to show signs of asphyxia and to die *in utero*, the mother being unaffected. If the bleeding is maternal in origin, there is usually other evidence of antepartum haemorrhage in the mother. Apart from some bleeding vaginally the woman might, for example, show signs of collapse or suffer pain over the uterus. The foetus may or may not be asphyxiated—depending on the degree of associated placental separation.

Maternal bleeding takes place from sinuses in the uterine wall; the affected sinus may be at the placental site, at the margin of the placenta, or elsewhere in the uterine wall. The blood at first lies in the chorio-decidual space and then bursts through the membranes into the amniotic sac. The initial haemorrhage may be caused by the passage of an instrument such as a bougie or Drew Smythe catheter outside the membranes, or by puncture of the pregnant uterus through the abdominal wall. In such circumstances the instrument may not only cause the haemorrhage, but may provide the opening through which the blood leaks within the amnion. Often, however, the initial haemorrhage is spontaneous and constitutes accidental antepartum haemorrhage, which may be of the concealed variety. In such cases the burst through into the amniotic sac can be spontaneous.

Although it is theoretically possible for the foetus itself to bleed from some lesion such as a surface haemangioma, in practice haemorrhage of foetal origin usually comes from foetal vessels of a normal or abnormal placenta, from the cord, or from a large vessel running in the membranes (velamentous insertion of the cord). The last is the most common explanation and is particularly likely if the vessel lies low in the uterus. A vasa praevia, however, more often bleeds externally (and is mistaken for accidental antepartum haemorrhage) than into the amniotic sac, or the vessel and the membranes rupture together and a mixture of blood and liquor then appears and is quickly followed by signs of foetal asphyxia.

If amniotic haemorrhage is maternal in origin the treatment is the same as for accidental haemorrhage. If it arises from foetal vessels, however, it is unlikely that the diagnosis will be made until the foetus has died and until it and the secundines are examined after delivery. If, however, the diagnosis is made before the foetus is irreparably damaged, delivery should be completed immediately by the method best suited to the obstetrical circumstances.

Are Phosphates Deposited in Acid Urine?

Q.—*Can a urine cloudy with a deposit of phosphates be either acid or alkaline?*

A.—A phosphatic deposit is nearly always found in an alkaline urine, but it is possible to have some phosphate deposited from a urine when the reaction is only just over the neutral point on the acid side and where the urine is concentrated. The calcium hydrogen phosphate (stellar phosphate) is the one likely to be found.

Pyrexia in Köhler's Disease

Q.—*A boy of 6 has Köhler's disease of the tarsal navicular. The x-ray appearances are classical, showing condensation and fragmentation of the nucleus with no sign of rarefaction of surrounding bones. His temperature has been persistently slightly elevated, averaging 98.8° F. (37.1° C.) in the morning and 99.6° F. (37.6° C.) in the evening for over four weeks, during which time he has been in a resting plaster with no weight-bearing whatever. There are no signs of any other focus of infection and the x ray of the chest is normal. Is this low-grade pyrexia an unusual feature, and should its presence delay the application of a walking plaster?*

A.—The pyrexia in this boy is probably unrelated to the Köhler's disease, which is thought to be due to an avascular necrosis or some other vascular abnormality. Weight-bearing need not be delayed. A plaster is not really necessary: the more usual treatment is to support the foot with a valgus sponge-rubber insole.

Ultra-violet Light for Vitamin-D Deficiency in the Tropics

Q.—*Is it worth prescribing ultra-violet light for vitamin-K deficiency diseases in a tropical country where there is plenty of sunlight?*

A.—No, provided exposure to sunlight can be assured.

Correction.—In our account (July 10, p. 107) of the presentation of honorary degrees by the University of Glasgow during the Annual Meeting we should have stated that the Vice-Chancellor, Sir Hector Hetherington (not, as we reported, the Chancellor), presented the degrees.

All communications with regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, LONDON, W.C.1. TELEPHONE: EUSTON 4499. TELEGRAMS: *Alitology, Westcent, London.* ORIGINAL ARTICLES AND LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone unless the contrary be stated.

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